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

ΕΛΛΗΝΙΚΗ ΕΠΙΣΤΗΜΟΝΙΚΗ ΕΤΑΙΡΕΙΑ ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ & ΓΕΩΤΕΧΝΙΚΗΣ ΜΗΧΑΝΙΚΗΣ

Τα Νέα της Ε Ε Ε Ε Γ Μ

197

Σεισμός Mianmar

Ο σεισμός σημειώθηκε στο ρήγμα του Sagaing, το τεκτονικό όριο μεταξύ της πλάκας της Ινδίας προς τη δύση και της Ευρασιακής προς την ανατολή.

Αρ. 197 – ΜΑΡΤΙΟΣ 2025

SIMSG ISSMGE
ISRM

ISSN: 2732-7248

Π Ε Ρ Ι Ε Χ Ο Μ Ε Ν Α

ΑΡΘΡΑ

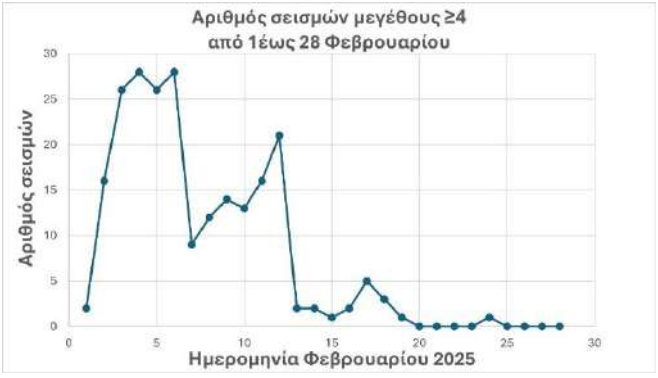
Γεωδυναμική τεκμηρίωση της σεισμικής ύφεσης στη Σαντορίνη

Ευστάθιος Χιώτης

Η σεισμική ύφεση στη Σαντορίνη είναι γεγονός. Ευχάριστα τα νέα για την εξέλιξη της σεισμικής σμηνοσειράς και αναμενόμενη η απόφαση των Επιτροπών για το άνοιγμα των σχολείων. Είναι καιρός πλέον για την επιστροφή της Σαντορίνης στους κανονικούς ρυθμούς. Γι' αυτό όμως δεν αρκούν τα διοικητικά μέτρα, χρειάζεται επιστημονική τεκμηρίωση πειστική για όλους και προ πάντων για τους κατοίκους και τους τουριστικούς παράγοντες. Θα επιχειρήσω στη συνέχεια να καλύψω το κενό αυτό με εύληπτους όρους.

Τεκμηρίωση της σεισμικής ύφεσης

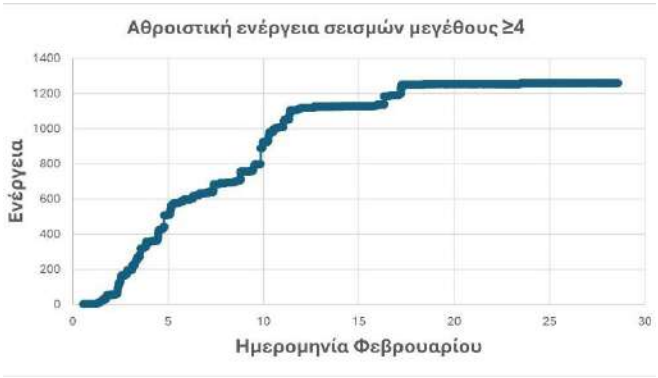
Προηγήθηκε έντονη σεισμική ακολουθία και καταγράφηκαν 3694 σεισμοί από το Εθνικό Αστεροσκοπείο Αθηνών το Φεβρουάριο 2025. Από αυτούς 228 ήταν οι πιο «ενοχλητικοί», μεγέθους 4 έως 5,3 Ρίχτερ, χωρίς όμως να είναι καταστροφικοί. Η ακολουθία σμηνοσεισμών εξελίχθηκε εντός είκοσι ημερών, όπως φαίνεται στην Εικόνα 1. Η μεγαλύτερη ανησυχία κατά τη γνώμη μου δημιουργήθηκε από την σύγχυση που επικράτησε ότι το φαινόμενο ήταν πρωτόγνωρο, και επομένως απρόβλεπτο, πράγμα που έγκαιρα αντέκρουσα με άρθρο μου που κατέθεσα και στον ΟΑΣΠ.



Εικόνα 1. Ημερήσιος αριθμός σεισμών μεγέθους τεσσάρων Ρίχτερ και άνω. Σαντορίνη, Φεβρουάριος 2025.

Άργησε να γίνει αντιληπτό από ορισμένους ότι επρόκειτο για σμηνοσειρά που δεν συνοδεύεται απαραίτητα από ενεργοποίηση ενός μεγάλου ρήγματος. Ο καθηγητής Βασίλης Παπαζάχος, του οποίου το σπουδαίο επιστημονικό έργο συνεχίζει με μεγάλη επιτυχία ο υιός, είναι σαφής στα γραπτά του. «Διακρίνομε τρεις κατηγορίες σεισμικών ακολουθιών. Στη πρώτη ο κύριος σεισμός συμβαίνει χωρίς να προηγηθούν προσεισμοί, ενώ στη δεύτερη κατηγορία προηγείται σεισμική ακολουθία, ακολουθεί ο κύριος και η μετασεισμική ακολουθία. Η τρίτη κατηγορία είναι οι σμηνοσεισμοί˙ η συχνότητα των σμηνοσεισμών αυξάνεται μέχρι τη μέγιστη τιμή και στη συνέχεια ελαττώνεται μέχρι να επανέλθει η κανονικότητα. Σμηνοσεισμοί συμβαίνουν συνήθως σε ηφαιστειακές περιοχές και είναι γενικά μικροί». Τη περιγραφή αυτή των σμηνοσεισμών αποδίδει θαυμάσια η Εικόνα 1, σε συνδυασμό με το σμήνος σεισμών της Εικόνας 3.

Αντιπροσωπευτικότερο μέτρο της ακολουθίας της Σαντορίνης είναι η εκλυόμενη σεισμική ενέργεια, την οποία υπολογίσαμε για τους σεισμούς μεγέθους τέσσερα Ρίχτερ και άνω. Ως μονάδα μέτρησης χρησιμοποιήθηκε η ενέργεια σεισμού μεγέθους τέσσερα Ρίχτερ. Στην Εικόνα 2 προβάλλεται η αθροιστική σεισμική ενέργεια συναρτήσει της ημερομηνίας το Φεβρουάριο 2025.



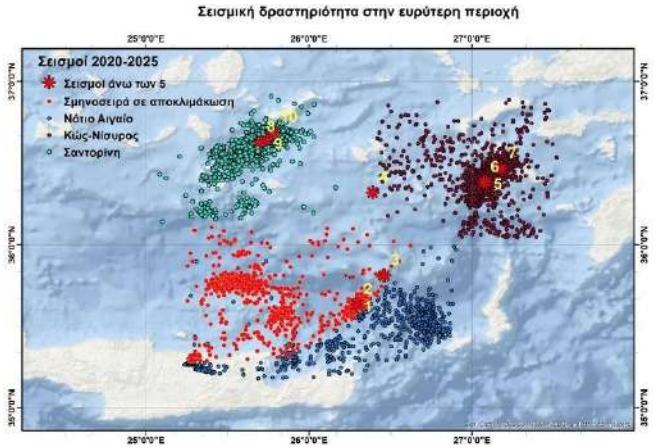
Εικόνα 2. Αθροιστική σεισμική ενέργεια σμηνοσεισμών Σαντορίνης από 1 έως 28 Φεβρουαρίου 2025, με μονάδα την ενέργεια σεισμού μεγέθους 4 Ρίχτερ.

Η κλίμακα Ρίχτερ είναι λογαριθμική και δημιουργεί λαθεμένες εντυπώσεις στο κοινό. Η απόσταση σεισμικής ενέργειας από τέσσερα σε πέντε Ρίχτερ πολύ απέχει από την αναλογική διαφορά από πέντε σε έξι. Πιο συγκεκριμένα, τα πέντε Ρίχτερ αντιστοιχούν σε σεισμική ενέργεια 32 φορές μεγαλύτερη από αυτή για τέσσερα, ενώ τα έξι Ρίχτερ εκπέμπουν χίλιες φορές μεγαλύτερη ενέργεια από το «τεσσάρι».

Με την επεξήγηση αυτή μπορεί να κατανοηθεί η θετική πλευρά σμηνοσεισμών της Σαντορίνης. Η έκλυση ενέργειας το Φεβρουάριο ισοδυναμεί με 1200 «τεσσάρια», είναι δηλαδή κατά 20% μεγαλύτερη από την ενέργεια σεισμού έξι Ρίχτερ που θα ήταν καταστροφικός για παλιές κατασκευές. Η εκπομπή της ενέργειας αυτής με μικρότερους μη καταστροφικούς σεισμούς οδηγεί σε εκτόνωση χωρίς ζημιές και αυτό είναι καθησυχαστικό, ακόμη και σε περίπτωση επανάληψης, που δεν μπορεί να αποκλειστεί. Και η ιδιομορφία αυτή ισχύει, όχι μόνο για τη Σαντορίνη, αλλά ευρύτερα για το Νότιο Αιγαίο.

Είναι πρωτόγνωρο το φαινόμενο σμηνοσεισμών στο Αιγαίο;

Περιέγραψα ήδη σε άρθρο μου ότι το ίδιο φαινόμενο συνέβη στη περιοχή Σαντορίνης – Κολούμπου – Ανύδρου το 2003. Ακριβώς το ίδιο φαινόμενο υπάρχει σε εξέλιξη εδώ και πέντε χρόνια στο Νότιο Αιγαίο, όπως φαίνεται στην Εικόνα 3. Στη μεγάλη αυτή περιοχή του Νοτίου Αιγαίου καταγράφηκαν δέκα σημαντικοί σεισμοί, όλοι κάτω από έξι Ρίχτερ. Ο μεγαλύτερος ήταν μεγέθους 5,7 όπως φαίνεται στον Πίνακα.



Εικόνα 3. Σμηνοσειρές σε εξέλιξη στο Νότιο Αιγαίο την τελευταία πενταετία. Σημειώνονται οι θέσεις δέκα σεισμών μεγέθους πάνω από πέντε Ρίχτερ που περιγράφονται στον Πίνακα.

ΠΙΝΑΚΑΣ1: Στοιχεία των δέκα ισχυρότερων σεισμών της Εικόνας 3

Σεισμικό γεγονός	Ημερομηνία	Γεωγραφικό πλάτος	Γεωγραφικό μήκος	Μέγεθος Ρίχτερ	Εστιακό βάθος χλμ.	Αριθμός στην Εικόνα 3
noa2020uawhn	12/10/2020	35.6314	26.293	5.1	21.3	1
noa2020ubdoy	12/10/2020	35.6328	26.2926	5.3	8.4	2
noa2022wubdq	20/11/2022	35.8099	26.4606	5.5	46.9	3
noa2023idrqr	26/04/2023	36.3199	26.3901	5.2	108.4	4
noa2021oxttx	01/08/2021	36.3821	27.0895	5.3	15.6	5
noa2021mceun	21/06/2021	36.3806	27.0708	5.7	15.3	6
noa2021hfywr	13/04/2021	36.4572	27.1797	5.2	15	7
noa2025dimpl	17/02/2025	36.628	25.6993	5.1	11.9	8
noa2025cnkwn	05/02/2025	36.6417	25.7423	5.2	12	9
noa2025cwqqj	10/02/2025	36.6838	25.7817	5.3	11.8	10

Το γεγονός ότι συνέβησαν μέσα σε πέντε χρόνια υποδηλώνει εκ πρώτης όψεως περίοδο διέγερσης. Η άποψη αυτή χρειάζεται ασφαλώς συστηματική διερεύνηση, ιδιαίτερα μάλιστα γιατί θα είναι καθησυχαστική, με την έννοια ότι η συγκέντρωση τάσεων και παραμορφώσεων εκτονώνεται συχνότερα και μάλιστα με τον ευνοϊκό μηχανισμό σμηνοσεισμών. Και αυτά χάρις στην ιδιαίτερη δομή της λιθόσφαιρας.

Το πάχος του φλοιού της γης στη τεκτονική τάφρο από τα Χριστιανά μέχρι το Κολούμπο και την Άνυδρο είναι μόνο είκοσι χιλιόμετρα περίπου. Το ίδιο επίσης ισχύει στο Νότιο Αιγαίο. Το γεωδυναμικό καθεστώς είναι εφελκυστικό και η καταβύθιση της Αφρικανικής πλάκας διευκολύνει αναθολώσεις του μανδύα και ηφαιστειακή δράση. Η ροή θερμότητας από το εσωτερικό της γης είναι αυξημένη και σε συνδυασμό με τα παραπάνω συμβαίνει και κάτι που περνάει απαρατήρητο. Μέρος της εκλυόμενης ενέργειας αποδίδεται ασεισμικά, δηλαδή με ερπυσμό και αργές ολισθήσεις χωρίς σεισμούς.

Δεν αποκλείονται βέβαια στο μακρινό μέλλον μεγάλοι σεισμοί όπως αυτός της Αμοργού, αλλά με μεγάλη περίοδο επανάληψης που κάνει απίθανο επί του παρόντος κάτι παρόμοιο στην εποχή μας.

Η σημασία του εστιακού βάθους και της προέλευσης των σεισμών από τον κατώτερο φλοιό

Κοινό χαρακτηριστικό της σεισμικότητας στο Νότιο Αιγαίο είναι ότι επικρατούν σεισμοί μεγάλου εστιακού βάθους, οι οποίοι μάλιστα προέρχονται από βάθη που δεν τους περιμένουμε. Λόγω του μικρού πάχους του φλοιού και της υψηλής ροής θερμότητας ο κατώτερος φλοιός από τα δέκα μέχρι τα είκοσι χιλιόμετρα περίπου θα έπρεπε να έχει όλκιμη (ductile) ασεισμική συμπεριφορά. Και όμως συγκεντρώνει κατ' εξοχήν τη σεισμική δραστηριότητα με σμηνοσεισμούς, όπως φαίνεται στην Εικόνα 4.

Εικόνα 4. Ιστόγραμμα εστιακού βάθους σεισμών θαλάσσιας περιοχής Κω-Νισύρου, με κύρια ζώνη εστιών στον κατώτερο φλοιό.

Αυτό υποδηλώνει ένα διαφορετικό τύπο σεισμικότητας που συνδέεται πιστεύω με υδρορωγμάτωση λόγω της διείσδυσης υδροθερμικών ρευστών υπό πίεση. Και δεν εννοώ μάγμα όπως συστηματικά αναφέρθηκε τελευταία, αλλά υδροθερμικά ρευστά όπως αυτά που εκλύονται στο ηφαίστειο Κολούμπο. Από τα ισότοπα ηλίου (He) που αναφέρονται σε δημοσιεύσεις της Νομικού φαίνεται ότι αυτά προέρχονται από τον μανδύα. Θεωρώ επομένως πολύ χρήσιμες τις δειγματοληψίες ρευστών από το ΕΛΚΕΘΕ, γιατί βοηθούν στη τεκμηρίωση της προέλευσης των σεισμο-μαγματικών εκδηλώσεων.

Επίλογος

Η παράδοση σεισμικότητας στην Ελλάδα που συνδέεται με ρήγματα επιφανειακής ανάπτυξης προκάλεσε αμηχανία στην επιστημονική κοινότητα, όσον αφορά στην ερμηνεία του φαινομένου των σμηνοσεισμών της Σαντορίνης. Αδόκιμα χαρακτηρίστηκε πρωτόγνωρο και επομένως χωρίς προηγούμενο και απρόβλεπτο. Σε συνδυασμό με τις ανεύθυνες προβλέψεις ηφαιστειακών εκρήξεων, συνέβαλε στην ανησυχία των κατοίκων. Πρόκειται όμως για φαινόμενο σύνηθες στο Νότιο Αιγαίο που χρειάζεται συστηματική επιστημονική παρατήρηση και ήδη έχουν αναπτυχθεί τα απαραίτητα δίκτυα μετρήσεων στη Σαντορίνη και εκτιμώ ότι θα έχουν αντικείμενο έρευνας για μήνες.

Η θετική πλευρά σμηνοσεισμών που καταγράφηκε στη Σαντορίνη είναι ότι η εκπομπή της σεισμικής ενέργειας γίνεται σε «μικρές δόσεις», μη καταστροφικές. Το φαινόμενο όμως δεν είναι τοπικό και τα δίκτυα θα πρέπει να επεκταθούν σε ακτίνα 100 περίπου χιλιομέτρων με πρώτη επιλογή τη Κω και τη Νίσυρο. Επιπλέον, εστιάζεται στον κατώτερο φλοιό που αντιδρά με υδρορωγματώσεις και μικρότερους σεισμούς στην εισπίεση υδροθερμικών ρευστών που προέρχονται από τον μανδύα.

Είναι καιρός να «απενοχοποιήσουμε» το ρήγμα της Ανύδρου, να βαθύνουμε και να πλατύνουμε την επιστημονική προσέγγιση. Ενδιαφέρει η θερμομηχανική συμπεριφορά της λιθόσφαιρας που είχα την ευκαιρία να προσεγγίσω στο διδακτορικό μου με επιβλέποντα τον καθηγητή Χαράλαμπο Τσουτρέλη. Η θερμοκρασία του φλοιού, συγκριτικά αυξημένη στη περιοχή, είναι μια μεταβλητή που θα πρέπει επίσης να συναξιολογηθεί.

Τα σεισμοτεκτονικά ή μαγματικά καταστροφικά φαινόμενα απαιτούν συνεχή παρακολούθηση και η αντιμετώπιση από επιτροπές δεν είναι η καλλίτερη λύση, τουλάχιστον επιχειρησιακά. Η μελέτη τους θα πρέπει να επανέλθει εκεί όπου ξεκίνησε παραδοσιακά, στην ΕΑΓΜΕ, διάδοχο του ΙΓΜΕ και του ΙΓΕΥ, την Εθνική Αρχή Γεωλογικών και Μεταλλευτικών Ερευνών.

Κηφισιά, 5 Μαρτίου 2025.

Ο Ευστάθιος Χιώτης είναι Δρ. Μεταλλειολόγος Μηχανικός ΕΜΠ, Μηχανικός Πετρελαίων Imperial College, πρώην διευθυντής στο Ινστιτούτο Γεωλογικών και Μεταλλευτικών Ερευνών και στη Δημόσια Επιχείρηση Πετρελαίων, όπου για μεγάλο διάστημα υπηρέτησε ως Διευθυντής Γεωφυσικών Ερευνών.

https://independent.academia.edu/Chiotis

https://www.researchgate.net/profile/Eustathios_Chiotis

https://energypress.gr/search-content?keys=%CE%A7%CE%B9%CF%8E%CF%84%CE%B7%CF%82

ΝΕΑ ΑΠΟ ΤΙΣ ΕΛΛΗΝΙΚΕΣ ΚΑΙ ΔΙΕΘΝΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΝΩΣΕΙΣ

ΕΛΛΗΝΙΚΗ ΕΠΙΣΤΗΜΟΝΙΚΗ ΕΤΑΙΡΕΙΑ ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ & ΓΕΩΤΕΧΝΙΚΗΣ ΜΗΧΑΝΙΚΗΣ

1ο Ρουμανο-Ελληνικό Σεμινάριο επί Σεισμικής και Γεωτεχνικής Μηχανικής
27 Μαρτίου 2025, Βουκουρέστι, Ρουμανία

Στις 27 Μαρτίου 2025 διοργανώθηκε στο Πανεπιστήμιο UTCB στο Βουκουρέστι το 1ο Ρουμανο-Ελληνικό Σεμινάριο Σεισμικής και Γεωτεχνικής Μηχανικής (1st Romania-Greece Seminar on Earthquake and Geotechnical Engineering). Την εκδήλωση παρακολούθησαν περισσότεροι από 120 εγγεγραμμένοι προερχόμενοι και από άλλες χώρες εκτός της Ρουμανίας και της Ελλάδας, ενώ η Ρουμανική Ένωση Γεωτεχνικής διοργάνωσε και παράλληλη τεχνική έκθεση στην οποία συμμετείχαν εταιρείες από τη Ρουμανία. Η εκδήλωση αυτή αποτελεί το αποκορύφωμα της μέχρι στιγμής συνεργασίας μεταξύ των δύο επιστημονικών εταιρειών της Ρουμανίας και της Ελλάδας χάρη στις προσπάθειες του Γενικού μας Γραμματέα Γιώργου Μπελόκα που έφερε σε επαφή μέλη των δύο εταιρειών και την καλλιέργεια αυτών των σχέσεων από τους προέδρους τους, Loretta Batali και Μιχάλη Μπαρδάνη.

Από ελληνικής πλευράς παρουσίασαν οι καθηγητές Κυριαζής Πιτιλάκης, Γιώργος Γκαζέτας και Γιώργος Μπελόκας, ενώ από Ρουμανικής η Loretta Batali, Radu Vacareanu, Cristian Arion, Alexandru Aldea, Alexandra Ene και Annabela Kotovanu.

Το αναλυτικό πρόγραμμα των παρουσιάσεων είχε ως ακολούθως:

9:30 – 10:00 – Υποδοχή

10:00 – 10:15 – Εναρκτήριες προσφωνήσεις

Prof. Loretta Batali – President SRGF

Prof. Radu Văcăreanu – Rector UTCB, President European Association of Earthquake Engineering

Dr. Michalis Bardanis – President Hellenic Society of Soil Mechanics and Foundation Engineering

10:15 – 11 :00 – Prof. Loretta Batali - Evolution and perspectives in the geotechnical design according to the 2nd generation of Eurocode 7

11:00 – 11:45 Prof. Kyriazis Pitilakis - Definition of seismic actions in the revised EC8 and implication in the seismic risk assessment

11:45 – 12:30 – Prof. George Gazetas - Foundation Design and Soil–Structure Interaction in the new EC8

12:30 – 13:15 – Assist. Prof. Giorgos Belokas - Ultimate Limit State Design Analysis of Foundations and Representative Strength of Soils in the new EC7

13:15 – 14:00 – Μεσημβρινή διακοπή για γεύμα

14:00 – 14:45 – Prof. Radu Văcăreanu - Probabilistic seismic hazard assessment and calibration of elastic design spectra in Romania

14:45 – 15:30 – Assoc. Prof. Cristian Arion - Direct and proxy seismic site characterisation in Romania

15:30 – 15:45 – Prof. Alexandru Aldea (UTCB), Florin Pavel (UTCB), Etienne Bertrand (Université Gustave Eiffel) - UTCB site response based on 20 years of observation

15:45 – 16:00 – Eng. Alexandra Ene – Assessment of soils stiffness for small strains by in situ tests and correlations for sites in Bucharest

16:00 – 16:15 – Assist. Prof. Anabella Coţovanu - Local site conditions in hybrid strong ground motion simulation

16:15 – 16:45 – Συζήτηση και κλείσιμο εκδήλωσης

Στον σύνδεσμο https://we.tl/t-Jev6dVYIKx θα μπορέσετε για περιορισμένο χρονικό διάστημα να κατεβάσετε τις παρουσιάσεις που έγιναν στο 1ο Ρουμανο – Ελληνικό σεμινάριο

Σύντομα τα αναρτηθούν οι παρουσιάσεις των ομιλητών σε μορφή pdf και οι μαγνητοσκοπημένες διαλέξεις στο κανάλι της ΕΕΕΕΓΜ στο youtube (https://www.youtube.com/@thechannelofhssmge5899)

Προετοιμάζεται ήδη η επόμενη αντίστοιχη εκδήλωση από τις δύο επιστημονικές εταιρείες που θα γίνει το Φθινόπωρο του 2025 στην Ελλάδα.

Οι Έλληνες προσκεκλημένοι της εκδήλωσης με την πρόεδρο της Ρουμάνικης Ένωσης Γεωτεχνικής Μηχανικής Loretta Batali

Ο Πρόεδρος της ΕΕΕΕΓΜ παραδίδει τιμητική πλακέτα στον Πρύτανη του UTCB Radu Vacareanu για τη φιλοξενία της εκδήλωσης στις εγκαταστάσεις του Πανεπιστημίου


Οι Κυριαζής Πιτιλάκης και Γώργος Γκαζέτας κατά την διάρκεια των ομιλιών τους


Ο Γιώργος Μπελόκας κατά την ομιλία της και ο Μιχάλης Μπαρδάνης κατά την αρχική του προσφώνηση

SIMSG ISSMGE

International Society for Soil Mechanics and Geotechnical Engineering

ISSMGE News
www.issmge.org/news

TC211 Live Zoom Presentation on "Insights in Geosynthetic-Reinforced Pile-Supported Embankments" - Part 2

ISSMGE IT Administrator / TC211 / 05-03-2025

ISSMGE TC211 will be holding an on-line ground improvement presentation on "***Insights in Geosynthetic-Reinforced Pile-Supported Embankments Part 2***" that will be presented by ***Dr. Suzanne van Eekelen***.

The presentation will be made on Zoom (link= ***https://utsmeet.zoom.us/j/89658918418***) at ***9 AM Central European Time*** *of* ***Friday 4 April 2025***, and the audience will have the opportunity to ask questions at the end of the presentation.

A further description of the presentation and a short biography of the speaker are in the attached **presentation flyer**.

Please share this invitation along with the presentation flyer to your network, colleagues and any other persons who may be interested in attending this very interesting topic.

We look forward to seeing you all on the day.

Kind regards,

Dr Babak Hamidi
ISSMGE TC211 Chair

ISSMGE LIFETIME ACHIEVEMENT MEDAL ANNOUNCEMENT AND CALL FOR NOMINATIONS 2025

ISSMGE Secretariat / General / 17-03-2025

The ISSMGE Awards Committee is announcing the call for nominations, for the ISSMGE Lifetime Achievement Medal (ILAM 2025).

The Lifetime Achievement Medal is awarded to a person who, by their knowledge, involvement, character and achievements, have made considerable and significant contributions to geotechnical engineering and practice in their country, region or at an international level. The award considers contributions over a whole of a career, and for the manner in which their work has touched and shaped the lives and views of many geotechnical engineers.

The nomination is made by the National Member Society of ISSMGE corresponding to the country of residence of the candidate, via the ISSMGE Vice-President of the corresponding region, who will advise about the received nominations.

The calendar and the procedure are as follows:

Calendar:

Call for candidates: 03rd February - 31st March 2025

National Member Societies can send nominations until the 31st March 2025, 23:59 hrs by email to the ISSMGE Secretary General (secretary.general@issmge.org) and to the corresponding regional Vice-president.

Pre-evaluation of candidates by regional Vice-presidents - 01st April -15th April

Deadline for pre-evaluated nominations to be submitted to the Awards Committee: 15th April 2025

Submission of proposals by the Awards Committee to the ISSMGE Board: 15th May 2025

Procedure

A maximum of 2 medals are given out recognizing geographical diversity.

The ISSMGE President or its regional representative will present the medal to the recipient in person, at a ceremony to be organized by the National Member Society.


Nomination of candidates

Candidates should be nominated by the National Member Societies via the regional ISSMGE Vice-presidents.

The call for candidates will be launched once per year and 2 medals will be awarded every year.

Nominations must be emailed to the Secretary General at (secretary.general@issmge.org) by the 31st March 2025, 23:59 hrs.

The Regional ISSMGE Vice-Presidents will pre-evaluate the nominations received and submit their outcome to the Awards Committee.

The Awards Committee will select upto 3 candidates from the different regions and submit their proposals to the ISSMGE board.

The ISSMGE board will select the recipients of the medal.

The application of the National Member Society should include:

- A general presentation of the candidate and their lifetime activity and achievements, with emphasis on the impact of their activity on the geotechnical engineering.
- The National Member Society's justification for their nomination based on the criteria below; this should not exceed 2 pages.

Criteria

Eligibility and basic requirements for the award are as follows:

- The proposed nominee should

- Be a well- known and respected member of the ISSMGE community in their country, region or interrnational level, and possess a lifetime of experience and practice and a be major influence on the geotechnical community

- Have played a significant contributory role to the geotechnical engineering industry in their country. Examples of contributions include, but are not limited to:

I. dedicated industry leadership,
II. contribution to innovative industry practice,
III. mentoring of young geotechnical engineers,
IV. long term contribution to administration, organization and leadership of geotechnical companies.
V. long term contribution to local geotechnical societies

- The award cannot be made posthumously. Particular attention should be given to those who are unable to travel and/or attend international conferences in the field, therefore cannot still present their achievements.
- There is a limit of 1 nominee per year per Member Society. If a nominee is not awarded in that year, the National Society can nominate them in subsequent year(s).

The Lifetime Achievement medals were awarded as follows:

2023
- Prof. Michele Jamiolkowski (Italy, posthumously)
- Prof. Harry Poulos (Australia)
- Prof. R. Neil Taylor (United Kingdom)

2024
- Dr. Suzanne Lacasse (Norway)
- Prof. Norbert Morgenstern (Canada)

Blind Prediction Competition

Alessandro Mandolini / TC212 17-03-2025

DEADLINE April 28th, 2025

REGISTER today to secure your spot and demonstrate your geotechnical skills on the global stage!

For more information visit: #BlindPredictionCompetition https://bwk.kuleuven.be/projects/sage-sand/blind-prediction-competition

The winner will be announced on the first day of the DFI-EFFC International Conference on Deep Foundations and Ground Improvement: Geotechnics Reimagined (Deep Foundations Institute / DFI Europe & EFFC - European Federation of Foundation), which will be held in Bruges in May 21-23, 2025 during the "Offshore Geotechnics Session"

ISRM International Society for Rock Mechanics and Rock Engineering

News

https://www.isrm.net

Next ISRM Young Members' Seminar Series on 13th March 2025-03-10

The next Young Members' Seminar will be held on 13th March at 8 AM (UTC) and will feature presentations from researchers from China and Australia:

- Predicting Peak Shear Strength of Rough Rock Joints via Normal Deformability Test by Yingchun Li (Dalian University of Technology, China)
- Micro-and macro-scale class-II fracture behaviour of brittle rocks in well-controlled Brazilian tests by Fauzan Yudho Pratomo (University of Adelaide, Australia)
- Granular Materials' Dynamics and Bio-consolidation by Yuqi Song (Monash University, Australia)

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

Richard Goodman 1935-2025 2025-03-13

It is with great sadness that we inform of the passing of Professor Richard Goodman.

Professor Goodman's immense contributions to rock mechanics and geological engineering have greatly influenced our field, and his work has guided and inspired many professionals around the world.

Professor Goodman's research, including block theory, the DDA method, and the Goodman Jack, has been groundbreaking. Beyond his innovations, he was a dedicated teacher and mentor who shaped the careers of many students, leaving a lasting impact on our community. Our thoughts are with his family and friends.

A complete obituary will be published in the March issue of the ISRM Newsletter.

ISRM Workshop on Soft Rocks (ISRM-WSR2025) - bulletin No. 2 2025-03-21

The ISRM Workshop on Soft Rocks will take place in Porto, Portugal, 15-16 May 2025, organised by the ISRM Commission of Soft Rocks, the Faculty of Engineering of the University of Porto (FEUP), the China University of Mining and Technology, Beijing, the Chinese Society for Rock Mechanics and Engineering (CSRME) and the Portuguese Geotechnical Society (SPG).

The new deadline for submission of papers is 10 April.

Click here to download the Bulletin No. 2.

For more information, click here to visit the Workshop website.

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

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

Join the 11th webinar of WG23 focused on "Shaft Design and Construction for Transit Systems" 05 March 2025

The 11th webinar of WG23 will focus on the practical aspects of planning, design, and construction of shafts for transit systems in dense urban areas.

This free webinar will take place on **Wednesday, March 5th, 2025, at 14:00 PM GMT** (see attached document for times in other locations).

Dr. Verya Nasri, Chief Tunnel Engineer and Senior Vice President at AECOM, will present the webinar. Dr. Nasri brings over 30 years of tunneling experience worldwide and has authored over 230 journal and conference papers in the field.

- **Download document**

ITACET Lunchtime Lecture Series #44 11 March 2025

This instalment of the Lunchtime lecture series will focus on **'Mechanised rehabilitation and lining works in tunnelling'** in collaboration with ITAtech & WG 14.

This LLS#44 will run on March 11th at 13:00 CET time

The episode featured three lectures and finished with a Q&A with all speakers.

- TES and LEM – two examples of current developments in mechanised tunnel renewal and installation of precast segmental lining – Volker Breuning
- Experience with the renovation of the Fachinger & Cramberger Tunnel with a mechanised tunnel enlargement system – Ulf Kirsten
- Innovative precast segment lining of a pair of 'D' shaped, road header excavated decline tunnels by using a Lining Erection Machine - Nick Lewis

Registration: Lunchtime lecture series #44 | Itacet

Scooped by ITA-AITES #131, 05 March 2025

Sydney Metro TBM's breakthrough at Clyde | Australia

Tunnelling challenges and advances in hydropower projects

Underground space needs to be well managed and used rationally | Vietnam

London's Thames Tideway Tunnel now fully connected

HS2 completes engineering works at Long Itchington Wood tunnel | UK

Delhi Metro Achieves Major Tunnelling Milestone on Golden Line | India

Delhi Metro launches Centre of Excellence in Tunnelling and Tunnel Training Centre | India

[Prague's 7.3bn Euro Railway Expansion with Two New Underground Tunnels to Revolutionize Train Travel, Reduce Congestion, and Enhance Regional Transport by 2047 | Czech Republic]

[Unbelievable Undersea Tunnel Engineering That Redefines Innovation | China]

[The $11.27bn tunnel that cuts travel time from 90 minutes to 15 minutes | Japan]

[The incredible undersea tunnel set to be 5x bigger than Channel Tunnel | Iran & Qatar]

BGA Sustainability Training Series
Session 02: Design and Construction

Wednesday, 12 March 2025, 17:30 -19:30 BST (GMT)
[in-person] No 1 King Street,.3rd Floor Joseph Gallagher Suite 3A, LS1 2HH, London

Event Information:

- The BGA ECG will be running three sustainability training sessions.
- Each session will consist of two short 15 min presentations, followed by an hour long group activity.
- Each session will be hybrid and held in different cities. It is strongly encouraged to attend all 3 sessions and at least one session in person.
- 2nd and 3rd sessions will be held in NE and NW of England

Session 02: Design and Construction

This will include:

- A presentation on the key sustainability considerations and opportunities during design and construction
- A presentation by Joseph Gallagher on sustainable construction
- Finally, there will be an hour long activity where teams need to make a fictitious project as sustainable as possible

Please note, advanced booking is required for this event. Please book using the link **Click to Register**

BTSYM March Workshop

Workshop by Bekaert: SFRC and Low Carbon Segmental Lining Design

Thursday, 20 March 2025, 14:00 - 17:00 (GMT)
[in-person] ICE HQ, One Great George, London SW1P 3AA

Event Information:

The design of concrete structures is crucial to structural stability. To achieve the required post-cracking tensile resistance and tension capacity, concrete structures need to meet strict norms. In this workshop kindly provided by Bekaert, Vini Casas and Ben Vanheuverzwijn, will introduce young engineers to the design principles of creating concrete structures reinforced with steel fibres.

2pm – 2:45pm

- Introduction SFRC: aspect/ratio, anchorage, tensile strength and ductility, correlation with concrete compressive strength,….
- Testing methods: EN 14651, EN 14488-5 (energy absorption), EN 14488-3 method B
- Sprayed concrete: Move from temporary sprayed concrete to permanent sprayed concrete linings

2:50pm – 3:00pm – 10min Coffee break

3pm – 3:50pm

- Low carbon segmental lining: overview of benefits with SFRC and some examples
- Crack control design principles and applications (e.g. cut and cover slab/wall)
- Quality control: wash-out test, EyeD machine, UPC device

3:50 – 4:00pm – 10min Coffee break

4:00pm – 5:00pm PRACTICAL SESSION

3 'simple' exercises:

- Simple case for segmental lining design based on some basic input for an actual case (demoulding, stacking, jacking, M-N envelope)
- Hybrid design for a cut-and-cover tunnel slab/wall, focus on crack width
- Moment capacity design for a slope stabilization/sprayed concrete lining.

Please note, advanced booking is required for this event. Please book using the link **Click to Register**

BTSYM March Lecture + BTSYM/BTS International Women's Day Celebration

Best practice sustainability frameworks for improving better outcomes for Tunnels

Institution of Civil Engineers, London SW1P 3AA
on Thursday 6 April 2025 at 18:00 hours

This lecture will help to demystify sustainability by firstly identifying the core elements of what sustainability means. We will describe how these topics might be considered relevant from a tunnels and underground space perspective. We will introduce BREEAM Infrastructure which is the world leading sustainability assessment, rating and awards scheme for civil engineering, infrastructure, landscaping and public realm projects. We will demonstrate how this best practice framework can help in identifying the key sustainability topics to address, what does good and best practice look like. We will illustrate the topic with examples of where we have applied the BREEAM approach on some interesting case studies including in the Antarctic for the British Antarctic Survey and in our work for High speed rail.

Speakers:

Rachel Jones

Rachel Jones has worked in the engineering consultancy sector for most of her 30 year career. Her work has focused on creating more sustainable solutions for clients embedding sustainability into plans, strategies and projects to influence decisions and culture. She has particular technical experience in development of sustainable engineering design, Environmental Social Governance (ESG) strategy development and reporting, implementation and review, circular economy practices, training and facilitation. Rachel is a trained BREEAM Infrastructure assessor and has applied her knowledge of best practice sustainability frameworks to support better sustainability outcomes.

Emma Jones

Emma Jones is a Director in the Ramboll Environment and Health, Sustainability and Carbon Team. She is an expert on infrastructure sustainability and has worked with numerous organisations on maximising sustainability within infrastructure strategies, programmes and projects across a number of sectors. She has been a BREEAM for Infrastructure assessor since 2003 when she was involved in piloting the original CEEQUAL scheme. She was also a verifier (auditor) for many years and has worked on BREAM for Infrastructure assessments for projects including Crossrail, the Olympic Park and various road, rail and defence projects. Emma was also the assessor for the first ever BREEAM for Infrastructure project in the Antarctic (Rothera Wharf) and is a recent WICE (European Women In Construction & Engineering) award winner.

INTERNATIONAL GEOSYNTHETICS SOCIETY

www.geosyntheticssociety.org

News

Next Fumio Tatsuoka Lecturer Announced March 3, 2025

A lecture series celebrating geosynthetics advances in the Asia region has named Professor Chao Xu as its next honored speaker. The Fumio Tatsuoka Lecture was **Read More »**

13th ICG Early Abstracts Acceptance Deadline Closing Soon March 6, 2025

Present your ideas at one of the most significant global geosynthetics conferences in the IGS calendar by submitting your abstract and short course proposals now. **Read More »**

IGS Foundation Annual Report 2024 Released March 11, 2025

The IGS Foundation (IGSF) marks another vigorous year of activity with the publication of its latest annual report. The report highlights the diverse initiatives the **Read More »**

Experts Gather For IGS Slovakia's National Conference March 17, 2025

More than 60 specialists from Slovakia and other nations gathered for IGS Slovakia's national conference, Geosynthetics 2025. Known locally as Geosyntetika 2025, the event is **Read More »**

High-Speed Railway Visit For China Delegates March 18, 2025

Attendees of a seminar on the construction technology of geosynthetic reinforced walls (GRS) for railways observed work on the new Shanghai-Chengdu line. The high-speed l ... **Read More**

BGA · THE BRITISH · GEOTECHNICAL ASSOCIATION

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

Advance notice of call for Nominations for the BGA Executive Committee 2025 02.03.2025

The BGA will shortly be calling for nominations for members to stand for election for the BGA Executive Committee. Read More

IGS UK Chapter Webinar on Design Using Geosynthetics 05.03.2025

ISO TR18228 – Design Using Geosynthetics : What do the 10 parts mean? IGS Webinar: 18:00 Tuesday 11 March 2025, presented by Derek Smith Read More

Professor R E Goodman 12.03.2025

The BGA is sad to report the death of Professor Richard Goodman, an eminent geotechnical specialist who delivered the 35th Rankine Lecture in 1995. Read More

The April 2025 issue of Ground Engineering is available on line 15.03.2025

The April 2025 issue of Ground Engineering is available on line. Online access to Ground Engineering (GE) is included in BGA subscriptions. Read More

Call for Nominations for the BGA Executive Committee 2025 15.03.2025

The British Geotechnical Association (BGA) is calling for nominations for members to stand for election to the BGA Executive Committee. Deadline 18 April 2025 Read More

On-line viewing Link for 63rd Rankine Lecture 19.03.2025

On-line viewing link for the 63rd Rankine Lecture by Professor Kenichi Soga Read More

Professor William Powrie announced as 64th Rankine Lecturer 19.03.2025

The British Geotechnical Association (BGA) is pleased to announce that the 64th Rankine Lecture will be delivered by Professor William Powrie of Southampton University. Read More

The 63rd Rankine Lecture

From Geo-monitor to Geo-adapt: leveraging distributed sensing and data analytics for performance-based design, construction, and maintenance

Professor Kenichi Soga.

Synopsis

Geotechnical engineers ensure the safety and cost-effectiveness of infrastructure assets by addressing uncertainties related to their lifespan and performance during hazards. Safety is often achieved by minimizing adverse outcomes through evaluating the probability of failure based on past experience and reliability analysis. At the same time, emerging technologies in sensing, communication, and computing now make it feasible to continuously and economically monitor geotechnical structures during construction and operation. This enables us to: (a) respond appropriately and effectively if a failure starts to happen, (b) cope with future unknown demands, and (c) find potential improvements for future design, construction, and operation of new infrastructure. The lecture will present three case studies (tunnels, pipelines, and deep foundations) to demonstrate how distributed sensing data and data analytic techniques can provide geotechnical insights, enabling us to adapt to ever-changing demands.

Professor Kenichi Soga
University of California, Berkley USA

Kenichi Soga is the Donald H. McLaughlin Chair in Mineral Engineering and a Distinguished Professor at the University of California Berkeley. He earned his BEng and MEng from Kyoto University in Japan and Ph.D. from the University of California at Berkeley. Prior to joining UC Berkeley in 2016, he was a Professor of Civil Engineering at the University of Cambridge. He has authored more than 450 journal and conference papers and co-authored the book "Fundamentals of Soil Behavior". His research focuses on infrastructure sensing, performance-based design and maintenance of un-derground structures, energy geotechnics, and geotechnics from micro to macro. He is a Fellow of the UK Royal Academy of Engineering, a Fellow of the Institution of Civil Engineers and a member of the US National Academy of Engineering. He has received numerous awards, including the George Stephenson Medal and Telford Gold Medal from the Institution of Civil Engineers, and the Walter L. Huber Civil Engineering Research Prize from the American Society of Civil Engineers. He is also a Bakar Fellow of UC Berkeley, working to promote the commercialization of smart infrastructure technologies.

(Event Date: Wednesday 19.03.2025 | 17:30-19:30, at the Great Hall, Sherfield Building, Imperial College London)

https://www.youtube.com/watch?v=5AxzE7RSGJk

The Rankine Lecture

The Rankine Lecture is widely viewed as the most prestigious of the invited lectures in geotechnics. It commemorates William John Macquorn Rankine, Professor of Civil Engineer-ing at Glasgow University, who was one of the first engineers in the UK to make a significant contribution to soil mechanics.

He is best known for his theory for the earth pressure on retaining walls.

News
www.geoinstitute.org/news

Civil underground curriculum workshop implementation program

Created: 22 Mar 2025

Call for Nominations and Applications!

ASCE and the Underground Construction Association (UCA) invite applications for the **Civil Underground Curriculum Workshop & Implementation Program**. This initiative supports educators in integrating civil underground content into junior-level structural, geotechnical, and construction engineering courses.

Civil underground involves the design and construction of tunnels, shafts, deep excavations, and underground infrastructure. ASCE and UCA technical committees have identified the shortage of trained civil engineers in this area as a major threat to this growing infrastructure sector.

Program Overview:

Ten professors/instructors will be selected to attend the **Rapid Excavation and Tunneling Conference (RETC)** in **Dallas, TX, June 8–11, 2025**, where they will participate in a curriculum workshop and learn about civil underground engineering. Participants will then implement appropriate lessons, homework problems, or presentations in a junior-level course during the **2025–26 academic year**. The curriculum is designed to teach existing core topics using civil underground examples. No prior experience in civil underground is required—just a passion for teaching civil engineering undergraduates!

Benefits:

- $1,500 honorarium
- All travel expenses to attend RETC 2025 covered

Eligibility:

- Must be teaching junior-level structural, geotechnical, or construction engineering at a U.S. institution in AY 2025–26

To Apply:
Submit your application by **April 20, 2025** at https://ucascholarships.secure-platform.com/a.

Required materials:

1. Brief description of why you'd like to participate
2. Summary of teaching experience and approach
3. Statement of the course where curriculum elements will be implemented
4. Curriculum vitae (CV)

Decisions will be made by April 30, 2025.

For questions or issues with the application portal, contact Mary Thomas at **thomas@smenet.org**.

Obituary for Professor Richard Goodman of the University of California, US

Richard E. Goodman Ph.D., N.A.E. (1935-2025)

Richard E. Goodman, a UC Berkeley faculty member from 1964 to 1994, passed away at the age of 89 in Anchorage, Alaska. He received his Ph.D. degree in Engineering Science (Geological Engineering) from the University of California, Berkeley in 1964. He received his B.S. degree in Geology in 1955 and M.S. in Civil Engineering and Economic Geology in 1958, both from Cornell University. He served 30 years on the faculty of the Department of Civil Engineering at U.C. Berkeley rising from Assistant Professor to Distinguished Professor of Geological Engineering. From 1994 to present he held the position of Emeritus Professor of Engineering.

Through his research and consulting, Professor Goodman made many important contributions in Rock Mechanics and Engineering Geology. Early in his career he developed an apparatus and method for in-situ measurement of rock properties, also known as the "Goodman Jack." In his pioneering work in identification of failure modes and kinematics of jointed (blocky) rock masses he invented the base friction apparatus, he led the first implementation of a contact element in finite element simulations, and, ultimately, he led the development of block theory and its applications.

He was passionate about teaching and he mentored 39 PhD students, most of whom were welcomed as family during their doctoral studies and maintained enduring relationships for decades. He was a prolific author with an impressive list of fundamental and advanced texts, including Methods of Geological Engineering in Discontinuous Rocks (1976); Introduction to Rock Mechanics (1980 and 1989); Block Theory and its Application to Rock Engineering, co-authored with Gen-Hua Shi (1984); and Engineering Geology – Rock in Engineering Construction (1993). He also authored the widely-acclaimed historical book Karl Terzaghi – The Engineer as an Artist (1999). In all, he authored or co-authored more than 200 technical papers for journal and conference publications.

His exciting life included spending six months in 1957 mineral prospecting on Baffin Island based out of Cape Dorsett. He camped amongst the polar bears in sub-zero temperatures, learned to communicate with the local Inuit people in their language, traveled around the area by dog sled, and survived many harrowing adventures. Later he became internationally known as a consultant and his consulting took him to every state of the union and throughout South America, Asia, South Africa and Europe.

Professor Goodman won numerous awards, including the E.B. Burwell Award from the Geological Society of America (1977); the Basic Research Award from the U.S. National Committee for Rock Mechanics (1984); and the H. Bolton Seed Medal from the American Society of Civil Engineers (ASCE). He was elected to the National Academy of Engineering (NAE) in 1991 and he was named the Rankine Lecturer by the British Geotechnical Society in 1995. The Norwegian Geotechnical Institute named him as their Terzaghi Fellow for 1995/1996. Among his other honors were the 2000 George F. Sowers Memorial Lecture at Georgia Tech, and the 2000 Civil Engineering History and Heritage Award from ASCE.

Closer to the home front, he was a passionate and brilliant musician. He traveled throughout the Bay Area to sing in

opera productions, and in 1979 founded the Berkeley Opera Company with the support of his cellist wife Lillian (Sue) and directed it for 13 years. He put on over 30 full stage productions. He performed over 70 major roles in operas for several companies, including roles such as Figaro, Leporello, Falstaff and Rigoletto.

He was an ardent lover of nature and passionate defender of wildlife and natural resources. He also was an extremely quick wit and always had a pun ready for every conversation. He never concerned himself with what other people thought and was never afraid to stand up for what he believed. Family, friends and colleagues remember him as "a force" and celebrate his eternal "boyish joy". He is survived by his beloved wife of over 67 years Sue, his daughter Lilly Goodman-Allwright, sons-in laws Michael Allwright and Eric Cohn, and four grandchildren. He was preceded in death by his two daughters Holly Cohn and Paula Goodman and several beloved dogs.

https://www.multibriefs.com/briefs/iaeg/Richard%20E%20Goodman.pdf

ΠΡΟΣΕΧΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΚΔΗΛΩΣΕΙΣ

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

IPA Seminar on Press-in Technology, 4th April 2025, Tunis, Tunisia, https://www.press-in.org/en

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

4th International Conference on TRANSDISCIPLINARY MULTISPECTRAL MODELLING AND COOPERATION FOR THE PRESERVATION OF CULTURAL HERITAGE Addressing World Challenges, 7-9 April 2025, Athens, Greece, https://www.tmm-ch.com

International Conference on Advances in Structural And Geotechnical Engineering (ICASGE'25), 14 - 17 April 2025, Hurghada, Egypt https://icasge.conferences.ekb.eg

Ground Engineering Piling and Foundations 2025, 22 April 2025, London, United Kingdom https://piling.geplus.co.uk/GEPI2025/en/page/home

IGIC 2ND INTERNATIONAL GEOTECHNICAL INNOVATION CONFERENCE

Shaping the World Beneath:
Fostering Sustainability, Innovation and Resilience in Geotechnics
5 - 6 May 2025, Jeddah, Saudi Arabia
https://geotechnicalinnovationconference.com

Event Overview

Following a highly successful launch edition, the 2nd International Geotechnical Innovation Conference (IGIC 2025), will continue to serve as a key facilitator of the Middle East's and primarily Saudi Arabia's ambitious giga projects, by enabling successful construction in the region's highly challenging desert soil. From the region's biggest construction projects, recent metro projects, bridges, tunnels and city development works, this premier gathering will address the myriad of underlying construction challenges via keynote presentations and latest case studies by world-leading gurus in geotechnical engineering.

Led by a core committee of geotechnical experts from MENA, IGIC is the region's only geotechnical conference for the industry, by the industry. The platform offers unparalleled opportunities to build strategic partnerships and collaborations with project owners, governments and municipalities leading projects, contractors, consultants, academia as well as geotechnical machinery providers.

Conference Themes in Discussion

1. Sustainability in Geotechnical Engineering

Focus: Strategies to minimize environmental impact, conserve resources, and promote eco-friendly practices in geotechnical engineering.

- Sustainable Foundations: Reducing CO2 Emissions and Enhancing Efficiency.
- Minimizing Environmental Impact of Urban and Sensitive Area Foundation Works.
- Lifecycle Assessment of Foundations for Long-Term Environmental Impacts.
- Sustainable Material Alternatives: Use of Recycled Aggregates and Green Cement.
- Coastal Protection and Erosion Control Strategies.
- Geotechnical Solutions for Climate-Resilient Infrastructure.

2. Innovation in Geotechnical Engineering and Soil Improvement Solutions

Focus: Cutting-edge methods and materials to improve soil and foundation performance under diverse environmental and structural conditions.

- Strengthening and Reusing Existing Foundations.
- Ground Stabilization Techniques for Extreme Environments (e.g., deserts, floodprone areas).
- Integration of Advanced Geosynthetics in Foundation Solutions.
- Bio-Based and Smart Materials for Adaptive Soil and Foundation Solutions.
- Innovative Geotechnical Construction Materials: Fiber-reinforced soils, nanomaterials, lightweight fills.

3. Geotechnical Resilience in Design and Practice

Focus: Enhancing infrastructure adaptability, durability, and recovery capacity in response to natural and man-made disasters.

- Designing Resilient Foundations and Infrastructure for Extreme Events.
- Adaptive Geotechnical Solutions for Post-Disaster Recovery and Reconstruction.
- Enhancing Soil and Foundation Performance under Dynamic and Cyclic Loading.
- Strategies for Improving Resilience to Seismic, Flooding, and Climate-Induced Risks.
- Monitoring and Feedback Systems for Resilient Geotechnical Systems.

4. Future Trends & Geotechnical Construction 4.0

Focus: Leveraging emerging technologies to optimize construction processes and improve design, monitoring, and efficiency in geotechnics.

- Building Information Modeling (BIM) for Geotechnical Projects.

- Automation and 3D Printing in Geotechnical Applications..
- Digital Twinning in Geotechnics.
- Digital Transformation in Foundation Design and Monitoring.
- Remote Sensing and Real-Time Monitoring in Geotechnical Engineering.
- Leveraging IoT and Big Data for Geotechnical Site Characterization.

5. Geotechnical Resilience in Design and Practice

Focus: Advanced computational methods to analyze and predict soil and structure behaviors under varied conditions.

- Finite Element and Finite Difference Methods for Complex Geotechnical Problems.
- Modeling Soil-Structure Interaction for Large-Scale Projects.
- Computational Geomechanics for Seismic and Dynamic Analysis.
- Integration of Numerical Models with Field Monitoring Data for Validation.
- Advanced Soil Models: Hardening Soil, Mohr-Coulomb, Cam-Clay, Barcelona Basic Model (BBM), Hypoplasticity Models.

6. Geohazards And Risk Mitigation

Focus: Identifying, monitoring, and mitigating geotechnical risksassociated with natural hazards and high-risk areas.

- Landslide Prediction, Monitoring, and Stabilization Techniques.
- Managing Risks of Soil Liquefaction in Seismic Zones.
- Geotechnical Solutions for Volcanic, Tsunami, and Earthquake-Prone Areas.
- Early Warning Systems for Geohazards Using Remote Sensing and IoT.
- Addressing Urban Flooding, Ground Subsidence, and Other High-Risk Areas.

7. Expanding Geotechnical Applications and Geothermal Energy

Focus: Exploring new and specialized applications of geotechnical engineering, including renewable energy and urban innovations.

- Geotechnics for Offshore Projects and Renewable Energy.
- Foundations and Solutions for Geothermal Energy Extraction.
- Urban Geotechnics: Challenges of Underground Space Development in Mega-Cities.
- Managing Ground Subsidence and Vertical Expansion in Urban Areas.

8. Innovating Risk Sharing and Aligning with Sustainable Standards

Focus: Sharing successful practices, challenges, and breakthroughs from regional geotechnical projects in MENA.

- Highlighting Geotechnical Engineering Projects in Infrastructure, Renewable Energy, and Urban Expansion.
- Lessons Learned and Innovations from Regional Projects.
- Offshore Geotechnics for Marine Structures in the MENA Region.

9. Notable Projects and Case Studies from Mena

Focus: Developing frameworks for risk management, ethical practices, and adherence to sustainability standards in geotechnics.

- Risk Mitigation Strategies for Complex Geotechnical Challenges.
- Integration of ISO 14001 and Similar Environmental Standards in Geotechnical Projects.
- Risk Sharing Frameworks for High-Stakes Projects.
- Legal and Ethical Considerations in Geotechnical Engineering Practice.

10. Workforce Development and Academia-Industry Collaboration

- Training, Education, and Cross-Disciplinary Collaboration in Geotechnical Engineering.
- Strategies for Enhancing Diversity and Inclusion in Geotechnical Workforces.
- Establishing Partnerships for Research and Development in Geotechnical Engineering.
- Collaborative Platforms for Knowledge Sharing and Skill Building.
- Industry-Supported Internships and Fellowships for Aspiring Geotechnical Engineers.
- Promoting Applied Research to Address Real-World Challenges.

Conference Agenda

Innovative Soil Improvement and Foundation Solutions

- Advanced ground improvement techniques for desert, semi-arid and coastal regions
- Novel deep foundation designs for high-rise structures
- Underpinning techniques for historical and sensitive structures
- Techniques for managing problematic soils in the Gulf
- Soil foundation structure interaction

Automation and Digital Twinning in Geotechnics

- Integration of Building Information Modeling (BIM) in geotechnical design
- Real-time simulations for excavation and retaining systems
- Digital twinning for underground constructions and tunnelling
- Benefits and challenges of adopting digital twinning in geotechnical projects

Key Areas of Focus

Focus Project Categories

Tall Buildings & Skyscrapers

- Tall, super tall and mega tall buildings
- Megacities

Transportation Infrastructures

- Bridges and highways
- Road and rail infrastructures

Underground, Civil Infrastructure and Deep Excavation Projects

- Underground pipeline network for oil, gas, water and sewage
- Underground infrastructure for telecommunications
- Tunnels and subways

Energy, Water and Coastal Infrastructure Projects

- Mine development
- Dam construction
- Man-made Islands
- Near-shore Oil & Gas projects

CONTACT US

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Organized by Creative CONNECT

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

Journées Francophones de Mécanique des Roches et Géologie de l'Ingénieur
14-15 mai 2025, Villeneuve d'Ascq, France

Les comités francophones de mécanique des roches et de géologie de l'ingénieur (CFMR, CFGI, RockEnGeo.be, Ingeokring et Géotechnique Suisse) se sont associés pour préparer une séance technique de deux jours, autour de la résilience des infrastructures face au changement climatique. Nous espérons que les visions croisées proposées autour des différents objets d'étude seront riches d'enseigne-ments et d'échanges.

Session 1 : Approche théorique des effets hydriques dans les massifs rocheux

Session 2 : Cavités souterraines

Session 3 : Falaises

Session 4 : Haute montagne

Session 5 : Itinéraire

Contact

Pour les questions relatives à l'organisa-tion: rima.ghazal@arteliagroup.com

Pour les questions relatives à l'inscription/ paiement: info@rockengeo.be

ISRM Workshop on Soft Rocks (ISRM-WSR2025), 15-16 May 2025, Porto, Portugal, Manuel Carvalho (manuel@fe.up.pt), Danting Hu (dantinghu@126.com)

T28th ICOLD Congress & 93rd Annual Meeting "Common Challenges, Shared Future, Better Dams", May 16th to 23rd, 2025, Chengdu, China, www.icold-cigb2025.com

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

17th International Congress of the Geological Society of Greece, Session "The 2024-2025 Santorini volcano-seismic crisis: Origin, Impacts and Consequences", 28-31 May, 2025 Mytilene, Lesvos, Greece, https://ege2025lesvos.gr

DTU TC101 workshop Expanding the boundaries of conventional laboratory testing, 2nd-4th June 2025, Copenhagen, Denmark, www.conferencemanager.dk/expandingtheboundariesofconventionallaboratorytesting

2nd International Symposium on GeoTest Sites (2nd ISGTS), 5-6 June 2025, Tampere, Finland https://events.tuni.fi/isgts

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

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

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

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

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

The Fourth Pan-American Conference on Unsaturated Soils, June 22 - 25, 2025, Ottawa, Ontario, Canada www.panamunsat2025.ca

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

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

AFRICA 2025 The Fifth International Conference and Exhibition on Water Storage and Hydropower Development for Africa, 8-10 July 2025, Accra, Ghana www.hydropower-dams.com

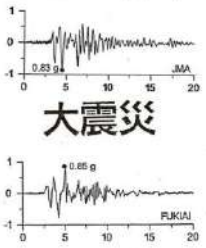
ISGSR2025 9th International Symposium for Geotechnical Safety and Risk, 24th – 27th August 2025, Oslo, Norway, www.isgsr2025.com

Giz2025.org 6th International Conference on GIS and Geoinformation Zoning for Disaster Mitigation (GIZ), August 28-30, Almaty, Kazakhstan, https://giz2025.org

ETH Zürich
Dept. of Civil, Environmental and Geomatic Engineering
Prof. Ioannis Anastasopoulos

National Technical University of Athens
School of Civil Engineering
Prof. G. Gazetas

On–site Short Course on
Geotechnical Earthquake Engineering
Kobe and Tokyo, Japan



30 August – 7 September 2025

Dr. Hiroyuki Kimata
High Pressure Gas Safety Institute of Japan
高圧ガス保安協会

Prof. Hisakazu SAKAI
Hosei University
法政大学

We are organizing once more our On-site Short Course on Geotechnical Earthquake Engineering. This year marks 30 years from the 1995 Kobe earthquake, and our Japanese colleagues are organizing the 30th Anniversary Memorial Workshop for the Great Hanshin Awaji (Kobe) Earthquake, which will take place in Kobe on September 1, 2025, and in which we will also have the opportunity to participate.

The On-site Short Course will take place in Kobe & Tokyo, Japan, from August 30 to September 7, 2025. It is the outcome of over 25 years of development, starting as a field trip in 1999 and taking place almost every year since then, being mainly offered to graduate–level students of the National Technical University of Athens. The course will offer graduate-level students and early career researchers a unique opportunity to study real case histories in the field, learning from the Japanese experience.

Please find attached a tentative detailed schedule of short course. Interested participants are invited to submit their application along with a CV via return email (ixa@ethz.ch) as soon as possible, but no later than March 31, 2025. The cost of the short course is CHF 1280 (in a double room), or 1480 (in a single room). This includes the hotels (6 nights in total, including breakfast), bus and tour guide, and the Shinkansen train from Kobe to Tokyo. No fees are charged for the participants. In your email, please indicate whether you would like a double or a single room, and in the case of a double, with whom you will be sharing.

Not included are the air tickets and the 30th Anniversary Memorial Workshop, which will be paid separately to the organizers in Japan. The detailed schedule includes also the flights that participants from Zurich will be taking. International participants may choose any flight they wish, but if they manage to get a flight connection from Dubai, this would allow them to arrive the same time with the Zurich group. If this is not possible, we will meet directly in Kobe on Sunday evening.

We have limited availability, and we will probably not be able to accommodate all requests. We thank you in advance for your understanding.

Best regards,
I. Anastasopoulos

UNSAT2025 5th European Conference on Unsaturated Soils, 1 to 3 September 2025, Lisbon, Portugal, https://eunsat2025.tecnico.ulisboa.pt

ISP8 Symposium International pour le 70ème anniversaire du pressiomètre / International Symposium for the 70th Anniversary of the Pressuremeter, 2nd to 5th of September 2025, LUXEMBOURG, https://isp8-pressio2025.com

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

EYGEC 29th European Young Geotechnical Engineers Conference, 9-12 September, 2025, Rijeka, Croatia, https://eygec2025.uniri.hr

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

TRANSOILCOLD 2025 7th International Symposium on Transportation Soil Engineering in Cold Regions, September 17-20, 2025, Incheon, Korea, www.transoilcold2025.org

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

GROUND ENGINEERING GEOTECH 2925 Where innovation meets opportunity, 2 October 2025, London, United Kingdom https://www.geplus.co.uk/news/ground-engineering-to-launch-geotech-2025-conference-where-innovation-meets-opportunity-16-01-2025

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

*f*OMLIG3 FLORENCE 2025 Third Workshop on the Future of Machine Learning in Geotechnics "Ethics and intelligences for a geotechnical Renaissance", October 15-17, 2025, Florence, Italy https://fomlig2025.com

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

6ο Πανελλήνιο Συνέδριο Αντισεισμικής Μηχανικής και Τεχνικής Σεισμολογίας (*6ΠΣΑΜΤΣ*), 30, 31 Οκτωβρίου και 1 Νοεμβρίου 2025, https://6psamts.eltam.org

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7ο Συνέδριο Αναστηλώσεων
13-15 Νοεμβρίου 2025, Αθήνα
www.etepam.gr/7o-synedrio-anastiloseon

Η ΕΤΕΠΑΜ διοργανώνει το **7ο Πανελλήνιο Συνέδριο Αναστηλώσεων που θα διεξαχθεί στην Αθήνα, στο Πολιτιστικό Κέντρο του Μουσείου Μπενάκη (Πειραιώς 138), στις 13-15 Νοεμβρίου 2025.**

Το Συνέδριο απευθύνεται σε επιστήμονες που προέρχονται από τους χώρους των φυσικών επιστημών και της τεχνολογίας και συνεισφέρουν στην προστασία και αποκατάσταση των μνημείων.

Αντικείμενο – Θεματολογία

Στο αντικείμενο του Συνεδρίου εμπίπτουν τα σχετικά με την Αναστήλωση των ιστορικών κτισμάτων (και των λειψάνων τους) ζητήματα, που αφορούν

α) στη φιλοσοφία και μεθοδολογία των επεμβάσεων,
β) στη σεισμική επικινδυνότητα και λοιπούς παράγοντες τρωτότητας των μνημείων,
γ) στην τεχνολογική έρευνα (τεκμηρίωση, τεχνικές, υλικά κ.λπ.) και εφαρμογή
δ) στην ανάδειξη μνημείων και αρχαιολογικών χώρων.

Η διάρκεια του συνεδρίου θα είναι τριήμερη και μία από τις συνεδρίες θα αφιερωθεί στο ειδικό θέμα **«Μνημεία και κλιματική αλλαγή»**.

Στόχος της διοργάνωσης είναι η ουσιαστική αλληλοενημέρωση και ανταλλαγή απόψεων μεταξύ συνέδρων και εισηγητών και η πρόκληση ενός γόνιμου διεπιστημονικού διαλόγου, που θα συνεισφέρει στην προώθηση (προς όλους τους φορείς υλοποίησης και προστασίας στη χώρα μας) της επιστημονικής προσέγγισης των θεμάτων προστασίας, αναστήλωσης, αποκατάστασης, ανάδειξης των μνημείων, καθώς και στη λήψη μέσων πρόληψης έναντι φυσικών καταστροφών.

Οι συνάδελφοι που επιθυμούν μπορούν να συμμετάσχουν με ανακοίνωση. Οι ανακοινώσεις που θα παρουσιαστούν πρέπει να είναι πρωτότυπες και να αποτελούν ουσιαστική συμβολή στο αντικείμενο, εκθέτοντας – στην περίπτωση των εφαρμογών – ολοκληρωμένη την αναστηλωτική προβληματική του συμμετέχοντα και – στην περίπτωση της έρευνας – την άμεση συσχέτισή της με τα αναστηλωτικά ζητήματα. Ανακοινώσεις με αντικείμενο την απλή απαρίθμηση εργασιών ή με αμιγή προσέγγιση ιστορίας της αρχιτεκτονικής δεν εμπίπτουν στην θεματολογία. Η γλώσσα του Συνεδρίου είναι η Ελληνική. Μπορούν να γίνουν δεκτές ανακοινώσεις στην Αγγλική, αλλά δε θα υπάρξει δυνατότητα μετάφρασης. Η διάρκεια των ανακοινώσεων δεν θα υπερβαίνει τα 15 λεπτά. Κάθε σύνεδρος μπορεί να παρουσιάσει μέχρι δύο ανακοινώσεις και να συμμετέχει σε τρεις ανακοινώσεις συνολικά.

Επικοινωνία – πληροφορίες:

e mail: **7etepam.conference@gmail.com**
τηλ: 6972082970 και 6932479368 για την Αθήνα
6980191672 για τη Θεσσαλονίκη

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

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

Join us for the **Inaugural Pan Mediterranean Geotechnical Engineering Conference**, a groundbreaking gathering of professionals, researchers, and industry leaders from across the Mediterranean region. Hosted in the vibrant city of Beirut, Lebanon, between 25 and 28 March 2026. This conference marks the beginning of an exciting journey to address the pressing geotechnical challenges faced by countries surrounding the Mediterranean Sea.

The Inaugural Conference Theme 2026

Bridging Borders: Geotechnical Challenges and Innovations Across the Mediterranean

With this theme, we highlight the unique geotechnical challenges faced by countries surrounding the Mediterranean Sea while emphasizing collaboration, knowledge exchange, and innovative solutions. This theme also reflects the conference's location in Beirut, a city known for its historical significance and strategic position as a cultural and economic hub in the region.

It aligns well with the diverse backgrounds and expertise of attendees from Mediterranean countries, fostering discussions on common issues such as seismic risks, coastal engineering, infrastructure development, and sustainable construction practices. Additionally, it underscores the importance of cross-border cooperation in addressing shared geotechnical challenges and advancing the field collectively.

This theme sets the stage for insightful discussions, networking opportunities, and knowledge sharing among geotechnical engineering professionals, researchers, and industry stakeholders attending the conference in Beirut.

Topics

- Ground Improvement for Challenging Soils
- Geotechnical Hazards and Risk Assessment
- Soil Structure Interaction
- Advancements in Geotechnical Investigation and In Situ Testing
- Geosynthetics and Reinforced Soil Structures
- Geotechnical Challenges in Offshore and Marine Designs
- Energy Geotechnics
- Earthquake Engineering and Seismic Design Considerations
- Environmental Geotechnics and Sustainable Design Practices
- Geotechnical Monitoring and Instrumentation for Infrastructure Projects
- Geo Education
- Transportation and Geotechnics
- Engineering Geology
- Artificial Intelligence in Geotechnics

Organizer

LGES Lebanese Geotechnical Engineering Society, contact@lges.org, www.lges.org, Follow us on LinkedIn, Send us a message

Event Management Company

iNFOMED, infomed@infomedweb.com, www.infomedweb.com, Tel. +961 1 510881 / 2 / 3, +961 71 103123

https://www.youtube.com/watch?v=d9GVCuPeXSU

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

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

ITA-AITES WTC 2026 Montréal

https://wtc2026.ca

On behalf of the Canadian Tunnelling Association and the 2026 World Tunnel Congress Organizing Committee, I'm pleased to extend my warmest greetings and invite you to take part in this not-to-be-missed event, which will take place from May 15 to 21, 2026, in Montreal, Quebec, Canada.

Montreal is an island at the confluence of the St. Lawrence and Ottawa rivers. Steeped in history yet at the same time a dynamic technological crossroads, Montreal holds THE top spot as a host city for international congresses in America, for many reasons: its legendary safety, its cultural dynamism (more than 30 languages are spoken here), its world-renowned gastronomy, not to mention underground Montreal and its 33 km-long pedestrian network.

The event will be held at the Palais des congrès de Montréal, one of the world's most renowned convention and exhibition centers, thanks to its event technologies, ultramodern spaces and exceptional organization services. The site features a vast exhibition area showcasing new technologies, original products and services related to underground construction. The exhibition, technical program and state-of-the-art conference setting will encourage interaction and the exchange of ideas.

The conference theme, "Connecting communities through underground infrastructure", addresses the vital role the tunnelling industry plays in connecting our communities through underground infrastructure. This enables the industry to build underground networks of transportation, water and sanitation, utilities and energy that cross, connect and unite cities, regions and continents.

WTC 2026 aims to bring together our international community of tunneling practitioners to share their experience and knowledge to make our projects safer, more economical, more resilient and more sustainable. It will not only generate considerable benefits for the tunnelling industry in Montreal, the province of Quebec and Canada as a whole, but will also promote Canadian expertise.

The scientific program, technical sessions and social activities will enable delegates to participate in exchanges, acquire new knowledge and establish new contacts with professionals from all over the world.

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

Dear Colleagues and Friends,

You are warmly invited to the 11th International Conference on Physical Modelling in Geotechnics (ICMPG 2026), which will take place in ETH Zürich, Switzerland, 8–12 June 2026! The conference will take place on the ETH Zurich Hönggerberg Campus, which is located just 15 minutes (with a direct bus link) from Zurich city center.

ICPMG 2026 aims to provide a dynamic forum for academics, engineers, researchers, technicians and students, where the latest developments in modelling techniques, technologies, similitude laws, and all other aspects of physical modelling in geotechnics will be discussed.

The conference will offer an up-to-date overview of the latest developments in multi-scale physical modelling within the following general themes:

- New facilities, new equipment, and measuring techniques
- Scaling laws and fundamentals
- Resilient Geotechnical Infrastructure
- Sustainability in Geotechnical Systems
- Energy geo-structures and foundation systems
- Onshore and offshore foundation systems

Besides centrifuge modelling, studies based on 1g shake table and large scale testing are warmly welcome, as well as research that combines numerical and physical modelling.

We are looking forward to your active participation, and kindly ask you to forward the announcement to your networks.

Prof. Ioannis Anastasopoulos
Chair of ICPMG 2026, TC104

Contact

Conference Office
ETH Zurich
ICPMG 2026
Institute for Geotechnical Engineering
Stefano-Franscini-Platz 5
8093 Zurich, Switzerland

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

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

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

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

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

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

Contact Information

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

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

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

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

Eurock 2026
Risk Management in Rock Engineering - an ISRM Regional Symposium
15-19 September 2026, Skopje, Republic North Macedonia

Contact Person Name
Prof. Milorad Jovanovski
Email jovanovski@gf.ukim.edu.mk

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

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

Slope Stability 2026

Slope for Safety Performance
an ISRM Specialized Conference
26 – 29 October 2026, Lima, Peru

Organizer: Sociedad Peruana de Geoingeniera (SPEG)

Contact Person Name: Antonio Samaniego and Luis Claudio Tejada Alvarez

Email asamaniego@srk.com.pe, geoingenieria@speg.org.pe

Telephone: +51999451060

Address: Grimaldo del Solar 875, Miraflores Lima -Peru

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

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

On behalf of the organizers, I would like to extend a warm welcome to the 14th Asian Rock Mechanics Symposium (ARMS14), which will be held in November 2026. This conference is a valuable opportunity to share the latest research findings and technological innovations in the field of rock mechanics in the Asian region, and to deepen exchanges among researchers and engineers. This is the third time Japan has hosted ARMS, following ARMS3 in Kyoto and ARMS8 in Sapporo. This time, ARMS14 has been selected as an official international symposium of the International Society for Rock Mechanics and Rock Engineering (ISRM).

The theme of the conference is "Rock Mechanics for the Next Generation ~ Innovations, Sustainability, and Resilience ~." This theme reflects our commitment to pursuing innovation, enhancing sustainability, and building resilience to address the next generation of challenges in rock engineering. This symposium will provide a platform to share the latest research findings and technologies, fostering new perspectives and collaborations. Additionally, we encourage the participation of young researchers through presentations and poster sessions, incorporating new viewpoints and ideas. We hope this will help the next generation of leaders grow and pave the way for the future of rock engineering.

Fukuoka, the host city, is known as an "international city" with strong ties to Asia, offering an attractive environment where history and modernity harmonize. During the symposium, in addition to academic discussions, you will have the opportunity to experience the nature and culture of Fukuoka, gaining further inspiration.

Finally, we hope that ARMS14 will be a significant opportunity to shape the future of the rock engineering field. We sincerely expect this international conference to be a starting point for next-generation research and technological innovation, contributing to new solutions for regional and international challenges.

Topics

Mitigation of Geo-hazards

Earthquakes and Rock Dynamics, Risk and Hazard Management, Disaster Mitigation, and Slope Stability

Environmental Issues

Global Warming, Carbon Dioxide Capture and Storage, Radioactive Waste Disposal, and THMC Coupling

Energy Resources

Mining Engineering, Petroleum Engineering, Geothermal Power Generation, and Reservoir Engineering

New Technologies and Fundamental Aspects

Rock Properties and Site Characterization, Geophysical Prospecting and Testing Methods, Tunnels and Underground Spaces, Maintenance and Life Cycle Costs, and Field Measurements and Back Analysis

Secretariat Office
Shinichiro NAKASHIMA, Secretary General
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16th International Congress on Rock Mechanics
Rock Mechanics and Rock Engineering
Across the Borders
17-23 October 2027, Seoul, Korea

Scope

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

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

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

XIXth European Conference on Soil Mechanics and Geotechnical Engineering
"Connecting Continents Through Geotechnical Innovations"
04-08 September 2028, Istanbul, Turkey

Conference Topics

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

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ΕΝΔΙΑΦΕΡΟΝΤΑ ΓΕΩΤΕΧΝΙΚΑ ΝΕΑ

Visualisations of soil constitutive models

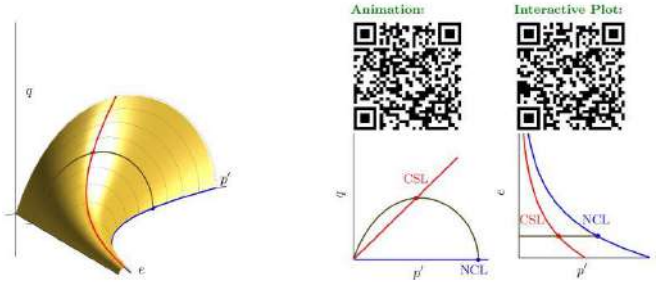
The visualisations of soil constitutive models that I regularly show here are part of an open educational project called 'Animating Soil Models': https://lnkd.in/dZSqs7A9

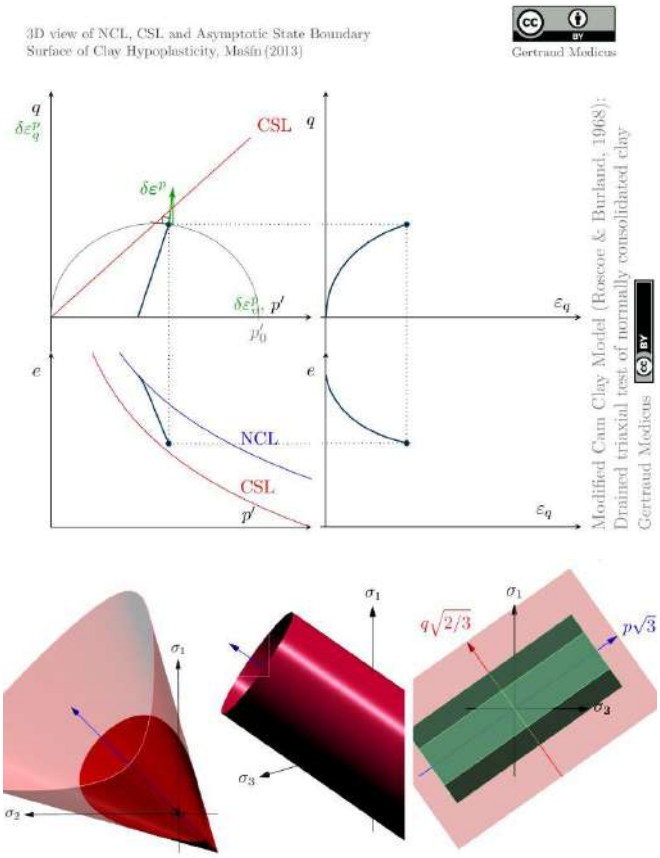
All visualisations are freely available under the open CCBY licence for teaching, learning and other purposes. I am happy if the content is used and useful.

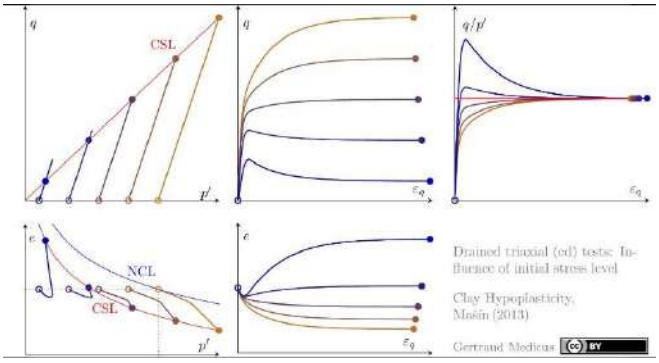
hashtag#AnimatingSoilModels aims to support the understanding of constitutive modelling through visualisations.

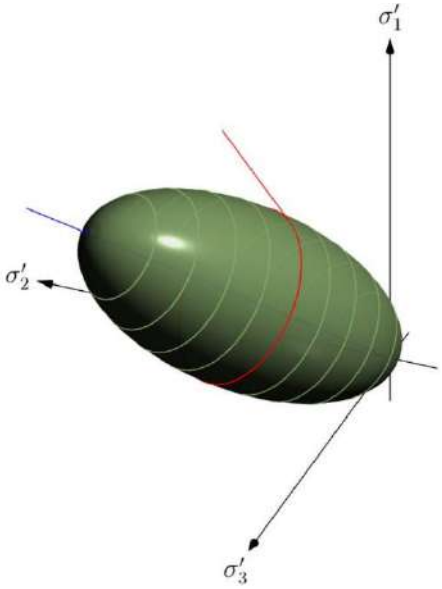
Topics include:

- Yield surfaces
- Stress invariants
- Critical State Soil Mechanics
- Models such as Modified Cam Clay Model or Hypoplasticity









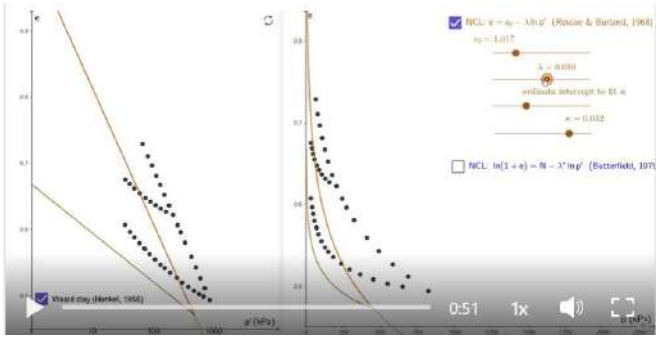
Use this interactive GeoGebra figure to fit some parameters to an isotropic compression test on Weald clay (Henkel, 1956): https://lnkd.in/dW3iWiEJ

- Calibrate e0, λ, κ for the Mod. Cam Clay Model (Roscoe & Burland,1986)
- Determine N, λ∗, κ∗ for Clay Hypoplasticity (Mašín, 2013)

Both models assume Normal Compression Lines, but use different formulations:

- MCCM: e=e0−λ·ln⁡p′ (Roscoe & Burland, 1986)
- Hypoplasticity: ln⁡(1+e)=N−λ∗·ln⁡p′ (Butterfield, 1979)

And as always: GeoGebra in engineering education is highly recommended



Gertraud Medicus PostDoc, Geotechnical Engineering 3rd March 2025

The World's Largest Record-Breaking Underground Tunnel Is Being Built In A Completely Different Way

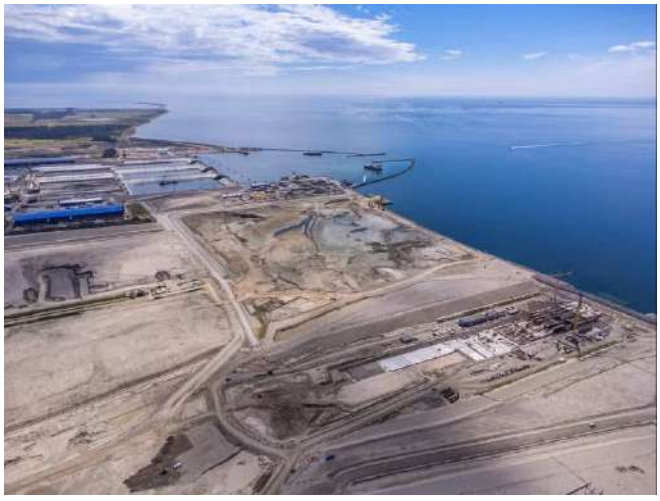
While finding out what's going on in the tunnels under Los Angeles may be interesting, this story takes us to Scandinavia. Under the Baltic Sea, something wild is happening. Engineers are playing what might be the world's biggest game of underwater LEGO, creating the record-breaking underground tunnel that will connect Denmark and Germany.

With a multi-billion-euro price tag, this isn't just a tunnel - it's a glimpse into the future of mega-engineering, where thinking outside the box means building inside a factory. Unlike some of the most beautiful ferry rides in the US, this ferry is less scenic. Think about shrinking this 45-minute ferry ride into a breezy 7-minute train journey.

That's exactly what this record-breaking underground tunnel will deliver when it opens in 2029. Stretching under the sea, this isn't just another infrastructure project - it's a testament to human creativity and the endless pursuit of finding cooler ways to connect people. However, building something on this scale with a new methodology is a discovery. Let's see how they do it.

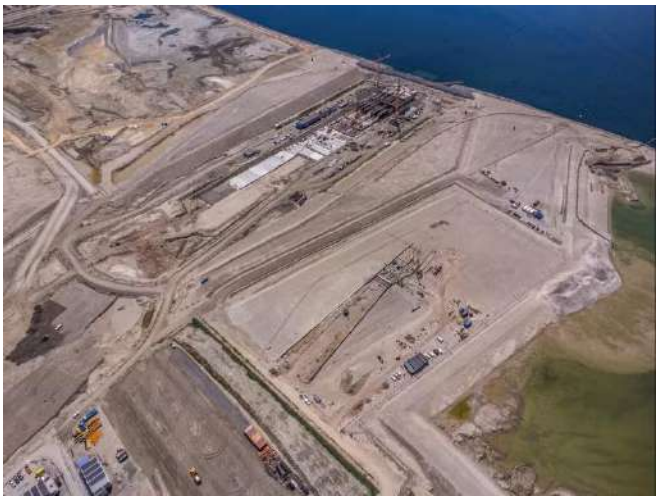
World's Largest Record-Breaking Underground Tunnel Isn't About Drilling Under The Sea...

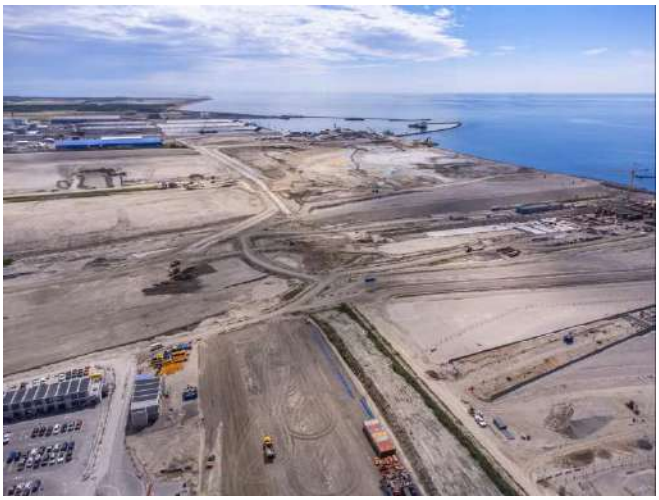
Where giant tunnel pieces are born, and engineers become artists



Remember Willy Wonka's chocolate factory? Well, this is the engineering equivalent - minus the Oompa Loompas. Near Rødbyhavn, Denmark, sits a massive factory making airplane hangars resemble toy boxes.

This is where the magic happens: 89 concrete segments, each weighing as much as 12,250 elephants (yes, really - 73,500 tonnes!), are crafted with the precision of a master baker preparing a wedding cake.





Each segment is a whopping 217 meters long - imagine laying down three Boeing 747s end to end and still having room for a food truck! It makes even more of a case for Denmark being the best country to retire to on a budget.

Cost	$7 Billion
Length	11 miles (18 km)
Bridging Points	Germany and Denmark

Giant Concrete Tunnel Pieces Are Sunk & Aligned Using A Precise GPS System

Giant tunnel pieces aren't the easiest thing to maneuver into place

So, how does a company get these massive concrete pieces into place without causing massive tidal waves? Think of it as parallel parking a building, but underwater. Each segment gets fitted with temporary steel bulkheads (fancy engineer-speak for giant waterproof doors) and then goes for a little float.

Using what might be the world's most precise GPS (accurate to within 8mm!), tugboats guide these floating concrete giants to their exact spot before letting them sink into a carefully dredged trench. It's another truly fascinating underwater phenomenon, albeit artificially crafted by modern technology.

Volume of Concrete 123 million cubic feet (3.5 million cubic meters)

Positioning Tolerance 1.18" horizontally, 2" vertically

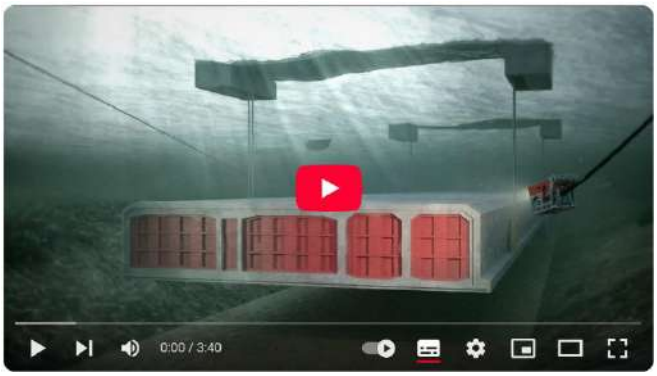
Long Life Expected to last 100 years with minimal maintenance

The Tunnel Is An Environmentally Friendly Construction While Creating Natural Areas

Sustainable Engineering is possible in the twenty-first century

With so many animals threatening to become extinct soon, humans must reduce their environmental impact when doing mega-construction projects. The Baltic Sea isn't just a big puddle - it's home to countless marine creatures who didn't exactly sign up for this renovation project.

But here's the cool part: the engineering team has thought about the underwater neighbors. According to the Danish Society for Nature Conservation, the project includes creating new natural areas and stone reefs on both the Danish and German sides. These new aquatic neighborhoods will give marine life more space to thrive.



https://www.youtube.com/watch?v=zf7C5DiEVpA

Reducing Emissions The tunnel will reduce the amount of emissions from vehicles traveling between countries

Solid Construction Transit between Denmark and Germany will be more dependable

Green Corridors Part of the construction will see green corridors for conservation

This New Way to Build Tunnels Promises Innovation

The underwater tunnel is designed for both vehicle and train transport

https://www.youtube.com/watch?v=1ZPmLKjAXfA

Imagine an underwater tunnel designed for more than just highway driving and with its own underwater train station. The record-breaking underground tunnel has five tubes running side by side, like parallel universes under the sea.

Two tubes are dedicated to cars zooming along a four-lane motorway, while another two host electric trains zipping back and forth at 200 km/h. A special service tunnel is running alongside, ready for any underwater emergencies.

Sophisticated Design Ventilation tunnels run longitudinally along the tunnel length

Fire Safety Fire in the tunnel won't stop vehicles ahead of the fire from getting out

Escape Doors Escape doors exist at 300-foot increments, allowing easy egress in emergencies

Thanks To Modern Engineering Of The World's Largest Record-Breaking Underground, The Future Is Now

The need for speed will soon be a reality

Fast-forward to 2029. Cars zoom under the Baltic Sea while fish swim overhead. Trains zip between countries faster than anyone can say "Fehmarnbelt" faster. This record-breaking underground tunnel isn't just changing the map—it's

revolutionizing how people think about connecting countries. Copenhagen to Hamburg in 2.5 hours? That's not just a travel update—that's a lifestyle revolution!

https://www.youtube.com/watch?v=pYqqgsABW2I

(Jason Dookeran / THE TRAVEL, 1st march 2025, https://www.thetravel.com/worlds-largest-record-breaking-underground-tunnel)

Studying This Slow-Moving Alaskan Landslide May Help Avert Future Disaster

If the landslide at the Barry Arm fjord collapses, its falling ice and rock could generate a devastating 650-foot-high tsunami

The Barry Arm landslide in Alaska's Prince William Sound
Christian E. Zimmerman / Public Domain

To live during an age of rapid climate change is to be witness to environmental collapse.

Sometimes these environmental disintegrations can be subtle, like the slow decline of an endangered keystone spe-cies or the gradual weakening of ocean currents. Other times, the collapse of the natural world sends signs that can't be ignored—stronger blazes, deadlier storms, record-breaking heat waves, devastating droughts.

And on September 16, 2023, scientists witnessed a climate-change-related collapse unlike any other.

Researchers around the world spotted an unusual oscillating sine wave sketched across seismographs. Later described as a monotonous hum, this signal originated from somewhere in eastern Greenland. The rumble traveled unnoticed below the feet of the planet's eight billion human inhabitants, and it reached Antarctica within an hour. The seismic activity of moderate earthquakes usually takes only minutes to dissipate, but for some weird reason, this signal continued emanating for another *nine* days.

"The seismic signal was something no one ever observed before," says Kristian Svennevig, a researcher at the Geological Survey of Denmark and Greenland who studied this strange signal. "This is a new natural phenomenon thrown at us by climate change."

Scientists didn't initially know what created this signal. It was so strange, seismologists simply labeled it an "unidentified seismic object." But after a year of scientific detective work, Svennevig, along with an international multidisciplinary team of scientists, pieced together the unprecedented geological story that unfolded in the remote watery inlet called the Dickson fjord.

The glacier in this particular fjord thinned so much that it could no longer support the rock above it. Known as "glacial debuttressing," this melting process suddenly and violently unleashed 25 million cubic meters (883 million cubic feet) of rock and ice. Debris roughly the same volume as 10,000 Olympic-sized swimming pools plunged into the water below, creating a 650-foot-tall tsunami. Thankfully, the fjord's finger-like geography largely contained the wave's energy and formed a seiche—a standing wave that moves in the same way water sloshes back and forth in a bathtub. Undulating against the fjord's walls every 90 seconds, the seiche essentially became a giant resonating chamber vibrating at a frequency of around 11 millihertz. At first this standing wave sloshed roughly 23 feet up the fjord's walls, but over the course of nine days it dissipated to only an inch or so before disappearing entirely. The rhythmic undulation of this dissipating seiche—slamming massive amounts of water back and forth against the fjord's rocky walls—is what ultimately caused the nine-day-long monotonous hum observed around the world.

"Had you suggested last summer if a wave could last for nine days in a fjord like that, no one would have believed it," Svennevig says. "But it happened—we have to re-equilibrate our perception of what could happen because of climate change."

While the Dickson fjord's strange seiche signal may be a seismic outlier, collapses like these are becoming more common. In 2015, the Taan fjord landslide on the other side of the Arctic in Alaska collapsed creating a 600-foot-tall tsunami, and just two years later, the Karrat fjord landslide in west Greenland generated a 325-foot-tall tsunami that ultimately claimed the lives of four people in Nuugaatsiaq, a small fishing village. Svennevig says that anthropogenic climate change is speeding up the global retreat of glaciers worldwide and increasing the frequency and magnitude of natural hazards on these slopes.

While scientists were caught unaware by the Dickson fjord landslide and other similar collapses, a fjord in Alaska called Barry Arm features a slow-moving landslide that gives experts an unusual opportunity to study a natural disaster in the making. Although it's difficult to pinpoint when this dangerous dance with gravity first began, a large section of the fjord has been sliding for at least a century. Geologists, seismologists and climatologists have flocked to the scene in an effort to understand this phenomena, making Barry Arm, in essence, a key Arctic laboratory.

Welcome to Barry Arm

The Barry Arm fjord is located in the Chugach National Forest

southeast of Anchorage. The fjord in the northwestern corner of Prince William Sound features glassy, calm water with imposing rock walls looming above it. The dramatic valley is accented by snow-capped peaks casting their shadows over a finger-like body of water half-encased in ice. This is the retreating Barry Arm glacier, and this disaster-in-progress was first spotted in 2019 by an artist kayaking in the fjord who noticed odd fractures on a cliff looming above the water. Although local geologist Bretwood Higman first dismissed Barry Arm as a landslide at first after analyzing the artist's photos, he later realized his mistake. "It turns out I had made a Geology 101 error. … I hadn't zoomed out enough, and I missed the big picture," he later told NASA. This potential landslide was far bigger than anything that had ever been reported.

Scientists from universities around the United States signed an open letter calling for immediate investigation of the site, and soon a wide network of teams across local, state and federal agencies turned their gaze on the fjord to assess its instability. The results? The land was collapsing in slow-motion. The analysis estimated that the landslide had shifted at least 600 feet from 2009 to 2015, and that in the event of a total collapse, communities and natural areas near Barry Arm could be destroyed.

In a worst-case scenario, an estimated 17.5 billion cubic feet of rock and ice would plunge into the water below—some 20 times more material than what fell in the Dickson fjord. Because of Barry Arm's geology, this landslide wouldn't produce a seiche but would create a 650-foot-tall wave. And in its likely path of destruction lies Whittier—a quirky town where many of its 260 or so inhabitants live in one 14-story building.

"It's such a beautiful place in northwestern Prince William Sound … then you just have this nasty-looking slope hanging out there," says the U.S. Geological Survey's (USGS) Dennis Staley, who's worked on Barry Arm since 2021. "Once you know it's there, it's hard to not see it."

Annotations show landslide areas of the Barry Arm fjord.
Gabe Wolken (June 26, 2020) / Public Domain

Since the landslide's discovery, various state and federal organizations—including the USGS, the National Tsunami Warning Center, the Alaska Division of Homeland Security and Emergency Management, the Alaska Division of Geological and Geophysical Surveys, the Alaska Earthquake Center, and the National Oceanic and Atmospheric Administration—began collecting data on the landslide using satellite-based radar, airborne lidar, aerial photography, local seismometers and remote cameras.

Even though Barry Arm is a serious threat, Staley says it's also an incredible scientific opportunity. Because of the slope's slow-moving collapse, scientists can study the landslide's historical rates of deformation and see how those changes relate to the retreat of the Barry Arm glacier. However, an ideal opportunity doesn't mean the Barry Arm fjord is a particularly forgiving laboratory.

"There's very few places to land a helicopter, you can't hike up to it, there's a tremendous amount of rockfall off the top, there are these massive tension cracks going across it," Staley says. "[We] installed a seismometer on the landslide itself … and it didn't even last eight months … it was taken out by an avalanche in April."

The immediate goal of the interagency effort is to develop a way to detect and locate tsunami-generating, or tsunamigenic, landslides as they happen and warn imperiled Alaskans of any impending waves—all in less than five minutes.

That's easier said than done. Alaska is one of the most seismically active places on the planet. Here the Pacific plate slips, or subducts, under the North American plate, and earthquakes—lots of earthquakes—are the natural result. Some 75 percent of all earthquakes in the U.S. greater than magnitude five occur in Alaska, and an earthquake occurs in the state every ten minutes on average. The state also experiences two types of landslides: those with glacial thinning like the one in Barry Arm and also shallow landslides caused largely by permafrost degradation. Understanding the dynamics at play at Barry Arm, as well as sifting through all the seismic noise to pinpoint these tsunami-generating landslides as quickly as possible, will one day save lives as more and more people move to these largely uninhabited spaces.

The dangerous conditions at Barry Arm and various other landscapes around the world have been millennia in the making. For the past 15,000 years, glaciers have moved across landmasses and formed mountain ranges, steep valleys, deep lakes and towering fjords. As the ice retreats to the poles, many rock walls become free. Some haven't been exposed to air for thousands of years, and others up to a million years. Because of our limited perception of these landslides—confined in data to only the past two centuries—Svennevig says we need to be prepared for events previously considered unimaginable.

Research seismologist Ezgi Karasözen's job is to detect these future landslides and protect communities vulnerable to subsequent tsunamis. She first studied earthquakes in Turkey and Iran, another seismic hotspot, and arrived at the Alaska Earthquake Center to do the same, until the discovery of Barry Arm shifted her focus.

"The Alaska Earthquake Center installed seismometers on Barry Arm to see what signals we were dealing with, and that's when I started working on this project," Karasözen says. "I like that I can actually do research that could help a community in real time."

In midsummer 2021, Karasözen, along with her colleague Michael West, traveled to Barry Arm, set up cameras and took notes of what they were hearing. Large glacial groans sounding like ominous, deep-throated booms echoed through the fjord as the glaciers melted in the midsummer heat. These rumblings were joined by other seismic activity common in this part of the world, making the scientists realize that sifting through these geologic noises wasn't going to be easy.

Because of the need to provide rapid detection and warning to surrounding communities, Karasözen and her team decided to keep the approach to detecting landslides as simple as possible. She decided to focus on long-period seismographs, which detail activity at lower frequencies, to help separate landslide events from other seismic background noise. Because this signal also looks similar across seismic stations, Karasözen uses this technique to essentially pinpoint where a landslide occurs.

Karasözen and her team began running tests across a larger area centered on Barry Arm in the summer of 2023, and they detected seven landslides in a few months. A year later, she says, the algorithms pinpointed around 30 of them. The landslides deposited anywhere from roughly 3.5 million to around 141 million cubic feet of rock and ice. None of them created a tsunami, but history suggests that that streak won't last long.

"It only takes one event to be really, really bad," Karasözen says. "You can't just say, 'Let's just let it happen and hope for the best.'"

Although the algorithm successfully detected dozens of landslides, it also proved adept at detecting some earthquakes with long-period signals similar to landslides. Karasözen and her team are now working with their growing data set of confirmed landslide signals to refine the algorithm so it isolates landslides from the typical rumblings of Alaska's dynamic geology.

An emerging science

Karasözen's hope is that this continually improving algorithm will be valuable for not just the Barry Arm region but the entire state, and possibly beyond—in Greenland and Norway. In fact, Staley's own work with the USGS has sent him to Norway, a country that's very familiar with fjords, to share data and techniques on how to study landslides and protect an area that's likely to see a boom in human activity as warming occurs.

As scientists develop algorithms, compare notes and take increasingly detailed data using airborne lidar and space-based satellites, Svennevig says that this relatively new field still has plenty of room for simple, old-school techniques.

He explains that there's still one tried-and-true field method that can uncover evidence of prehistoric landslides, known as paleo-landslides, that could possibly help prepare us for what comes next. "Where I see a huge task for me as a geologist." Svennevig says, "is just walking around and looking at rocks."

(Darren Orf / Smithsonian MAGAZINE Science | March 18, 2025, https://www.smithsonianmag.com/science-nature/studying-this-slow-moving-alaskan-landslide-may-help-avert-future-disaster-180986191/

ΕΝΔΙΑΦΕΡΟΝΤΑ - ΣΕΙΣΜΟΙ & ΑΝΤΙΣΕΙΣΜΙΚΗ ΜΗΧΑΝΙΚΗ

Risk-to-life from a coseismic landslide-triggered tsunami in Piopiotahi/Milford Sound, Aotearoa/New Zealand

A new paper (Davies and Dykstra 2025) in the International Journal of Disaster Risk Reduction asks some very interesting questions about societal risk-to-life in a key tourist area.

On 9 December 2019, a small phreatic eruption occurred on Whakaari/White Island in Aotearoa/New Zealand at a time when there were 47 people, most of whom were tourists, on the site. Tragically, 22 people were killed and many others were seriously injured. The tragedy has led to considerable focus on risk-to-life in Aotearoa/New Zealand with respect to tourist activities – this is a country with abundant natural hazards. It is generally agreed that the risk-to-life at Whakaari/White Island was unacceptable, and a number of prosecutions followed.

However, if it is agreed that the risk-to-life was unacceptable, then a similar question must be asked for other tourist sites in New Zealand. There is a really interesting new paper (Davies and Dykstra 2025) in the *International Journal of Disaster Risk Reduction* that starts to ask some very interesting questions around this topic, with a particular focus on the Piopiotahi/Milford Sound area. The analysis is fascinating and unsettling.

Piopiotahi/Milford Sound is a major tourist attraction in southern New Zealand. Consisting of a spectacular fjord landscape, it is located in an area with high seismic hazard. There is a distinct possibility that a major earthquake would trigger collapses of the fjord walls, which in turn would have the potential to generate highly destructive local tsunami. Clearly, this would be an exceptionally dangerous situation for anyone located in the area.

The spectacular topography of Piopiotahi/Milford Sound in Aotearoa/New Zealand. Note the tourist boat. Image by Olywyer, published under a CC licence.

Davies and Dykstra (2025) note that, in 2019, Piopiotahi/Milford Sound was visited *"…by road by about 870,000 people, plus about 60,000 by air and about 300,000 (passengers and crew) in cruise ships. While most visitors spend only part of a day at Milford, some stay overnight, and about 200 people work there and remain overnight; cruise ships are present for about 9 h on average. Most of the day visitors take a small-boat cruise on the fiord, and those who do not almost always remain within about 10 m of sea level."*

The paper seeks to calculate the individual risk-to-life (i.e. how likely is it that you, as an individual, would be killed if you were to visit) and the societal risk-to-life (i.e. what is the aggregate risk for all visitors over time) for both Whakaari/White Island and Piopiotahi/Milford Sound. This is, in itself, very challenging, involving a cascade of models (the likelihood of an earthquake, the resultant likelihood of landslide, the characteristics of the tsunami, etc.). The authors have developed a rigorous methodology to allow these analyses.

For Whakaari/White Island, the individual risk-to-life was marginally acceptable given that visiting was a voluntary activity (assuming that the visitors were made aware that the site had a significant level of risk – many of the survivors contend that this level of information was not provided). On the other hand, the societal risk-to-life was most definitely not acceptable, and the individual level of risk carried by the guides (who visited the site on multiple occasions) was also unacceptable. Tourist visits to Whakaari/White Island ae no longer permitted, and rightly so.

So what about Piopiotahi/Milford Sound? The individual risk-to-life is most definitely in the acceptable range, and is considerably lower than at Whakaari/White Island. However, the number of visitors is vastly greater. Davies and Dykstra (2025) have calculated that an "average" event at Piopiotahi/Milford Sound would see 1,006 people exposed to the hazard, resulting in 750 fatalities. Thus, such an event would be a true disaster. The resultant societal risk is considerably higher than for Piopiotahi/Milford Sound (0.75 fatalities per year) than it is for Whakaari/White Island (0.3 fatalities per year).

Davies and Dykstra (2025) examine whether the risk could be managed by, for example, forecasting of events. However, earthquakes cannot be predicted, and the proximity of the fault to the site means that alert systems based on the detection of seismic waves would provide little warning. The conclusion is that the only feasible way to manage the risk-to-life is to reduce vulnerability – i.e. to reduce visitor numbers.

Thus, Aotearoa/New Zealand is left with a substantial dilemma. Davies and Dykstra (2025) report that visitors to Piopiotahi/Milford Sound spend about NZ$200 million per year. Thus, the financial impact of cutting visitor numbers is potentially severe, and in simple economic terms cannot be justified. However, should an event occur that led to 750 fatalities, there is little doubt that there would be a view in the aftermath that the risk was unacceptable.

The decision as to whether this level of risk should be tolerated is one for society, not for scientists. However, taking a decision to change the status quo would be highly contested, and it is extremely difficult to explain concepts of societal risk to a wide audience.

This situation is not unique to Aotearoa/New Zealand of course, but most other areas with high levels of societal risk associated with tourism have not had a Whakaari/White Island type event to bring the issue into focus.

Reference

Davies, T. and Dykstra, J. 2025. Societal risk-to-life from natural hazards: Assessments, acceptability and actions at Wha-

kaari/White Island and Piopiotahi/Milford Sound, Aotearoa/New Zealand. *International Journal of Disaster Risk Reduction*, **119**, 105325. https://doi.org/10.1016/j.ijdrr.2025.105325

(Dave Petley / THE LANDSLIDE BLOG, 5 March 2025, https://eos.org/thelandslideblog/piopiotahi-1)

Study reveals how solar heat affects earthquake activity

A new study by researchers at the University of Tsukuba examined the role of solar heat in earthquake activity. By analyzing seasonal variations in seismicity, correlations between solar activity and earthquakes, and the influence of atmospheric temperature on earthquake predictability, the study provides new insights into how solar-driven thermal effects may contribute to stress changes in the Earth's lithosphere.

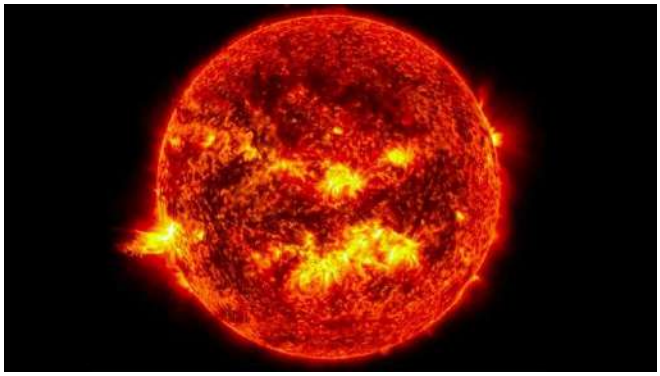


Image captured by NASA's Solar Dynamics Observatory on June 20, 2013 shows the bright light of a solar flare on the east side of the Sun. Credit: NASA/SDO

The study, led by Matheus Henrique Junqueira Saldanha, a Ph.D. candidate at the University of Tsukuba, and other university researchers, explores mechanisms by which the Sun affects seismic activity on Earth. It expands on a 2022 study by Saldanha and Yoshiro Hirata that established the causal influence of solar activity on earthquake activity on Earth. Hirata is also a contributor to the current study.

"Among the methods we use, one of them is edit distances, which allows us to compare patterns of earthquake occurrence spread around a geographical area. Radial basis functions were used to process these distances and obtain estimated values of next-day maximum earthquake magnitude," Saldanha told The Watchers.

He also added that they used delay-coordinate embeddings on sunspot and surface temperature data to use them with radial basis functions.

The study analyzed earthquakes worldwide from January 1, 2000, to August 31, 2021, using earthquake catalogs from multiple global sources and solar data, including sunspot numbers and atmospheric temperatures. It found that seismic activity shows seasonal variations that correspond with changes in solar irradiation, indicating a significant impact of solar activity on earthquakes.

The paper explored different mechanisms through which solar activity could influence seismic activity. These include thermal stresses induced by solar heat affecting the Earth's crust and indirect effects through changes in atmospheric and oceanic conditions.

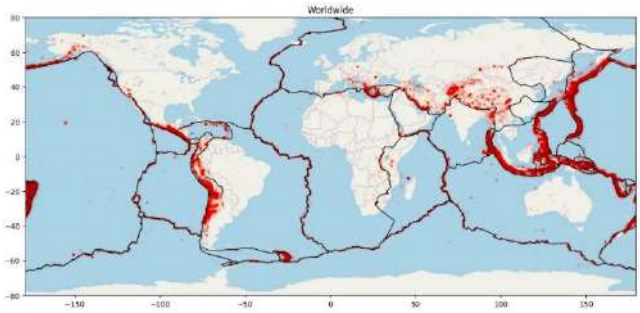
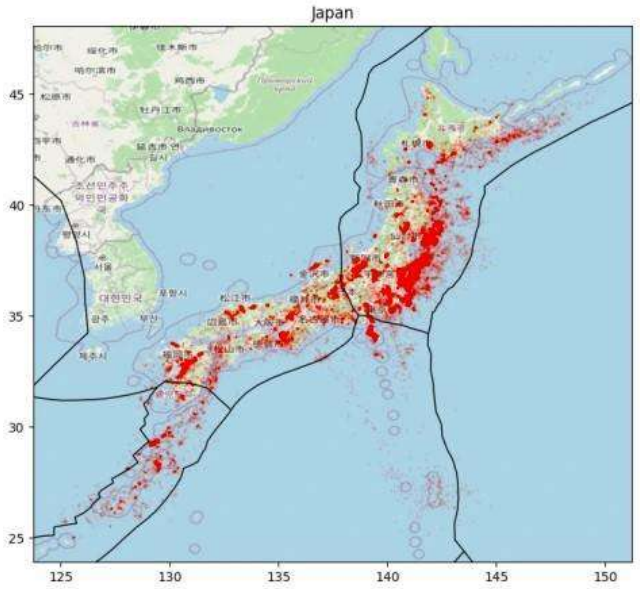
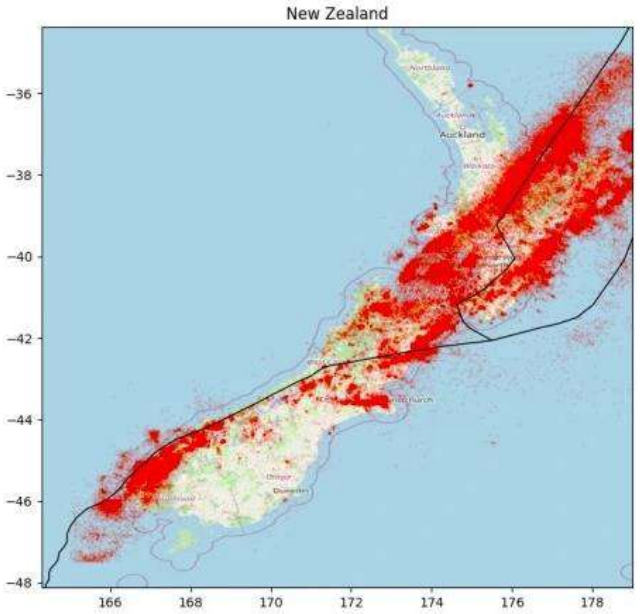


Illustration of the earthquake catalogs analyzed. Earthquakes are shown as semi-transparent red dots, and plate boundaries are shown in black. Image credit: *The role of solar heat in earthquake activity*, Matheus Henrique Junqueira Saldanha et al.





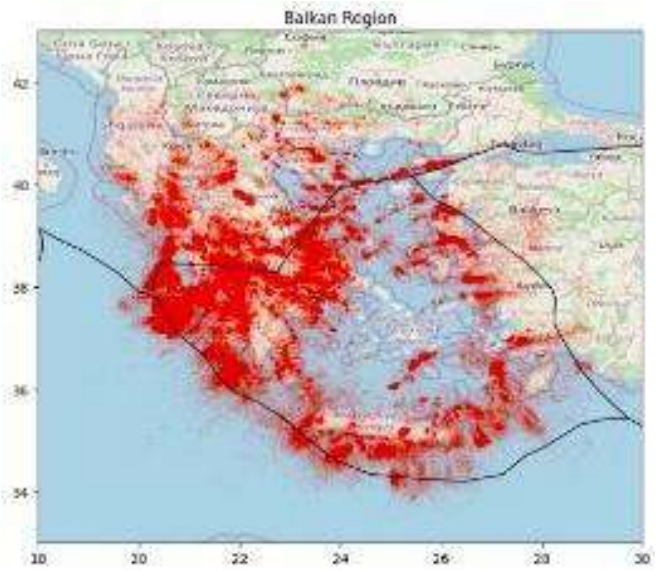


Illustration of the earthquake catalogs analyzed. Earthquakes are shown as semi-transparent red dots, and plate boundaries are shown in black. Image credit: *The role of solar heat in earthquake activity*, Matheus Henrique Junqueira Saldanha et al.

One of the key findings was a delayed cause-effect relationship between solar activity and earthquakes. Solar heat takes time to get absorbed into deeper layers of the crust, delaying its effect on seismic activity. The delay depends on the location, the depth of geological features, and the thermal properties of the material in different regions.

The analysis found different delay periods for different regions to provide better earthquake forecasts. For Japan, a delay of around 30 days provided the best earthquake forecasting accuracy, while for other areas like the Balkans, longer delays ranging from 180 days to even a year provided the best results.

"Our findings provide new evidence that solar activity and atmospheric heat influence seismic activity. This adds an important piece to the puzzle of earthquake forecasting, suggesting that climate-related factors may play a more significant role than previously thought," said Saldanha.

"Understanding these influences could help refine earthquake prediction models and improve our ability to anticipate seismic events," he added.

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[1] The role of solar heat in earthquake activity – Matheus Henrique Junqueira Saldanha, Masanori Shiro, Yuji Yagi, Yoshito Hirata – Chaos – March 1, 2025 – https://doi.org/10.1063/5.0243721

(Rishav Kothari / THE WATCHERS, Monday, March 10, 2025, https://watchers.news/2025/03/10/study-reveals-how-solar-heat-affects-earthquake-activty)

Researchers warn of another mega-quake as Japan commemorates 14th anniversary of 2011 disaster

As Japan marks the 14th anniversary of the 2011 Tohoku mega-quake—a magnitude 9.0 disaster that killed nearly 16 000 and triggered the Fukushima crisis—a new study from Tohoku, Hokkaido, and JAMSTEC researchers warns that strain building in the Chishima Trench off Hokkaido could unleash another magnitude 9.0 quake in the coming decades.

Researchers from Tohoku and Hokkaido universities and the Japan Agency for Marine-Earth Science and Technology (JAMSTEC) have released the results of their five-year study of the Chishima Trench off Hokkaido.

The results indicate that strain accumulation due to plate movements could lead to a mega-quake in the near future. Using seabed GPS stations installed in 2019, the team observed that the Pacific Plate is sliding toward the Okhotsk Plate at roughly 8 cm (3.1 inches) per year, while a station on the continental plate mirrors this movement—suggesting the plates are locked and building tension.

This echoes patterns seen before the 17th-century quake believed to have rocked the region, raising concerns of a repeat event.

With the government estimating a 7% to 40% chance of a magnitude 8.8 or higher quake within 30 years, researchers warn that a sudden release of this strain could trigger a magnitude 9.0 disaster, potentially unleashing tsunamis and threatening tens of thousands of lives along Hokkaido's coast.

The team plans to conduct further research at another location off Hokkaido to collect additional data.

Tomita Fumiaki, an assistant professor at Tohoku University's International Research Institute of Disaster Science, warned that memories of the 2011 Great East Japan Earthquake and Tsunami are fading. With that in mind, he called on people to stay ready for another potential mega-quake.

An SH-60F helicopter assigned to the Chargers of Helicopter Antisubmarine Squadron (HS) 14 from Naval Air Facility Atsugi flies over the port of Sendai to deliver food to survivors of the Fukushima Disaster. Image credit: U.S. Air Force

Today, Japan marks the 14th anniversary of the 2011 Tohoku earthquake and tsunami, which claimed nearly 16 000 lives and left 2 526 people missing. The disaster was triggered by an M9.0 mega-quake that generated a nearly 15 m (50 feet) high tsunami, causing the Fukushima Daiichi nuclear meltdown—the world's second-worst nuclear accident after Chernobyl in 1986.

The earthquake struck at 14:46 JST (05:46 UTC) on March 11, 2011, with its epicenter about 130 km (80 miles) southeast of Sendai in Miyagi Prefecture, at a depth of roughly 32 km (20 miles) beneath the Pacific Ocean floor. It resulted

from the rupture of a segment of the Japan Trench subduction zone, where the Pacific Plate thrusts beneath the Eurasian Plate.

It was the fourth most powerful earthquake ever recorded globally and the strongest to strike Japan since the advent of modern seismology.

The quake was felt as far away as Petropavlovsk-Kamchatsky, Russia; Kaohsiung, Taiwan; and Beijing, China. It was preceded by multiple foreshocks, including a M7.2 event centered about 40 km (25 miles) from the main quake's epicenter. In the following days and weeks, hundreds of aftershocks occurred, including dozens of M6.0 or greater and two exceeding magnitude 7.0.

Image of flooding at Sendai Airport caused by the tsunami of March 11, 2011 (The image was taken on March 13, 2011). Image credit: U.S. Air Force

The quake triggered a 13–14 m (43–46 feet) high tsunami, which disrupted the power supply at the Fukushima Daiichi nuclear power plant.

Although all three operating reactors were successfully shut down, the power loss caused their cooling systems to fail within the first few days of the disaster.

Rising residual heat in the reactor cores caused the fuel rods in reactors 1, 2, and 3 to overheat and partially melt, resulting in intermittent radiation releases.

Melted material accumulated at the bottom of the containment vessels in reactors 1 and 2, creating sizable holes in the vessel floors—a fact that was revealed in late May. Those holes partially exposed the nuclear material in the cores.

Reactors of Fukushima Power plant after the March 11, 2011 disaster. Image credit: Digital Globe/Wikipedia

Explosions resulting from the buildup of pressurized hydrogen gas occurred in the outer containment buildings enclosing reactors 1 and 3 on March 12 and March 14, respectively.

Workers sought to cool and stabilize the three cores by pumping seawater and boric acid into them. Due to concerns over potential radiation exposure, government officials established a 30 km (18 miles) no-fly zone around the facility. A land area within a 20 km (12 miles) radius around the plant—covering nearly 600 square km (232 square miles)—was evacuated.

A third explosion occurred on March 15 in the building surrounding reactor 2. The explosion created a second hole in the containment vessel; the first hole had been caused earlier by melted nuclear material passing through the bottom of the vessel.

In response, government officials designated a wider zone, extending to a radius of 30 km (18 miles) around the plant, within which residents were asked to remain indoors. The explosion, along with a fire caused by rising temperatures in spent fuel rods stored in reactor 4, led to the release of higher levels of radiation from the plant.

The severity of the disaster continued to escalate. On April 12, he Nuclear and Industrial Safety Agency rated the incident as level 7, the highest level on the International Nuclear Event Scale, following a report by the Japan Nuclear Energy Safety Organization (JNES).

The combination of a massive earthquake, a devastating tsunami, and the Fukushima nuclear disaster made it one of the most catastrophic natural and technological crises ever recorded.

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[1] Experts: Unreleased stress energy off Hokkaido is enough to trigger mega-quake – NHK – March 9, 2025

(Rishav Kothari / THE WATCHERS, Tuesday, March 11, 2025, https://watchers.news/2025/03/11/researchers-warn-of-another-mega-quake-as-japan-commemorates-14th-anniversary-of-2011-disaster)

Seafloor cables detect Pacific Ocean earthquakes

Earthquakes have been detected in the Pacific Ocean using cable-based ocean monitoring techniques employed by scientists from the National Physical Laboratory (NPL) and New Zealand's Measurement Standards Laboratory (MSL).

Over 70 per cent of the Earth's surface is covered by water, but the ocean floor is largely unmonitored - *AdobeStock*

The team is performing ultra-sensitive optical measurements, converting a branch of the Southern Cross Next seafloor cable, which connects New Zealand to Australia, into an

array of sensors for earthquakes and ocean currents. The technique uses the optical fibre inside the cable as the sensing element and gathers environmental data from the seabed, where no other permanent sensors exist.

In a statement, Giuseppe Marra, principal scientist, NPL said: "We are very excited to have started detecting earthquakes and ocean currents in the Tasman Sea. This is the very first test of this technology in the Pacific Ocean and the waters surrounding New Zealand are the 'perfect laboratory' to demonstrate the full potential of these…techniques for Earth sciences and coastal population protection."

The Pacific Ocean is a highly seismically active area and since the start of the measurements in October 2024, the team has recorded over 50 earthquakes, with an epicentre from tens to hundreds of kilometres from the cable.

Using NPL's technique, the team will be collecting measurements until December 2025, providing the potential to develop a worldwide monitoring network of seafloor sensors using the existing subsea infrastructure.

Over 70 per cent of the Earth's surface is covered by water, but the ocean floor is largely unmonitored, thereby limiting humankind's understanding of the Earth's structure and dynamic behaviour. The sensing technique being tested in the Tasman Sea can counter this and improve understanding in several scientific areas.

GNS Science, New Zealand, will analyse the data to assess its potential for detecting tsunamis and explore how these new technologies can be complementary to more traditional approaches. According to NPL, the synergy between old and new techniques could improve the ability to respond to natural hazards.

The international collaboration has been enabled by the UK's International Science Partnership Fund and is supported by New Zealand's Quantum Technologies Aotearoa programme.

Bill Fry, seismo-tectonophysicist, GNS said: "This is an awesome and creative example of leveraging existing data sources and expertise from around the world to increase our eyes and ears in the vast expanse of the Pacific Ocean. We believe that adding these new cabled data will complement other rich data sources and collectively deliver faster and better tsunami warnings that will save lives in New Zealand and across the Pacific."

(THE ENGINEER, 17 Mar 2025, https://www.theengineer.co.uk/content/news/seafloor-cables-detect-pacific-ocean-earthquakes)

Shaking up earthquake safety in Nepal with a folk song

Geophysicist Shiba Subedi combines science and songwriting to raise awareness and debunk earthquake myths.

Growing up in Jaljala, a remote village in western Nepal, Shiba Subedi was a bright student with a passion for extracurricular activities. He excelled in debates, essay competitions and poetry, but one interest stood above the rest: a deep fascination with Nepal's folk melodies.

After finishing secondary school, Subedi pursued a two-year science degree at Prithvi Narayan Campus in Pokhara, a bustling city in western Nepal. As well as growing academically, he was drawn into the vibrant world of folk music in the local bars.

Shiba Subedi (left) explains plate tectonics to Dilip Subba during an earthquake exhibition at the Nepal Academy of Science and Technology. Credit: Atul Karn

However, his father thought that pursuing music would ruin Subedi's chances of having a serious career. Determined to change his son's mind, he travelled by bus for five hours to Pokhara. "He stayed for four days, trying to convince me to give up music," Subedi recalls. "But I was resolute."

Dismissing his father's concerns, Subedi continued his musical journey alongside his studies. In 2009, he wrote songs that brought him national recognition and commercial success, earning nearly 200,000 Nepalese rupees — a sum that, at the time, equated to roughly US$2,700 and was more than the average middle-class annual income in Nepal. "My father never questioned my musical pursuit after that," he adds.

However, after 2015, when a disastrous earthquake struck Nepal, Subedi's dual careers would become intertwined. At the time, he was pursuing a master's degree in physics at Tribhuvan University in Kathmandu, but the disaster's aftermath shifted his focus and the rest of his studies towards geophysics. Now a geophysicist at the Nepal Academy of Science and Technology in Lalitpur, Subedi combines his songwriting passion with an expertise in earthquake monitoring and analysis. He visits schools, educating students and teachers about earthquake preparedness, and uses his melodies to reach even broader audiences.

For his efforts, Subedi was honoured last November with the Judges Commendation in the John Maddox Prize for standing up for sound science and evidence. The prize is a joint initiateve of the London-based charity Sense about Science and *Nature*.

A quake jumpstarts a career

In April 2015, when the massive 7.8-magnitude Gorkha earthquake struck Nepal, Subedi was on Tribhuvan University's campus and witnessed a person die when the university's gate collapsed onto their car. "It was a devastating scene," he says.

Nearly 9,000 people were killed. Subedi heard about tragic but preventable deaths, such as one in Melamchi: probably following bad advice, a teenage girl who was standing in a garden ran back into her house during the earthquake to take cover under a table instead of remaining outside in an open space. Subedi began searching for ways to better prepare Nepalese society for future quakes.

That led him to earn a second master's degree, this time in exploratory geophysics at the Paris Institute of Planetary Physics in 2016. Subedi's master's supervisor connected him with György Hetényi, a geophysicist at the University of Lausanne in Switzerland, to discuss pursuing a PhD in Hetényi's group. However, Hetényi was hesitant. He recalls thinking at the time: "If he gets a PhD in a classical research domain and goes back to Nepal, then he will not have adequate instruments or resources." Instead, Hetényi invited Subedi to work in his group while pursuing a PhD in educational seismology, focusing on outreach to students and teachers to raise awareness about earthquakes.

When Subedi enrolled in his PhD in 2018, Nepal's primary and secondary schools had scarce resources for teaching earthquake science. Hetényi and Subedi co-founded the Seismology at School in Nepal campaign, showing teachers and students how to use earthquake sensors and teaching the basics of earthquake waves, energy levels and seismic activity. "If students can measure even small-scale earthquakes, it could spark their interest and inspire future scientists," he explains.

Subedi observes a house damaged in the 2023 Jajarkot earthquake in western Nepal.Credit: Shiba Subedi

There were some advantages to Subedi's side career in popular folk music. First, his social-media connections helped him to quickly identify schools to participate in the campaign. Second, "people love celebrities", he adds. "When I introduce people to the songs I've written and then explain my academic interests, they are much more receptive to my message."

Shreedhar Dhakal, a science teacher at Shree Shiva Secondary School in Kawasoti in southern Nepal, has participated in the teachers' awareness workshops. He recalls when he first started teaching students about earthquake safety drills — classic manoeuvres such as 'drop, cover and hold', meaning to drop to the floor, find cover under a table or cover your head with your arms and hold your position until the shaking stops — the parents complained. "They thought it was unnecessary," Dhakal says. But over time, he says, they came to appreciate these efforts.

Making an awareness song

Until the school-outreach work, Subedi had never revealed his musical career to Hetényi. "I thought it was important to keep my academic and musical pursuits separate," he says. "Otherwise, people might think I dabble in everything, and question my credibility."

But during one of the teachers' workshops, which Hetényi attended, Subedi invited a singer friend to provide some entertainment, and another attendee casually mentioned Subedi's musical success to Hetényi.

"I was very surprised," Hetényi recalls. But he immediately followed up with a request: "Why don't you make a song about earthquake awareness?"

Subedi was initially dismissive. Hetényi remembers him saying: "No. Earthquakes are not a topic for a song. Period."

Hetényi says he isn't usually one to push, but after attending several teachers' workshops in Nepal, he noticed how deeply participants engaged with the folk-music entertainers. He realized that songs, with their brevity and pleasing melodies, could resonate more powerfully with some people than could scientific papers or lectures. After some gentle persistence, Subedi agreed to give it a try.

However, translating complex academic terms into catchy, relatable phrases that can sync to rhythmic and repeated musical beats was no easy task. "For example, how do you explain plate tectonics to people with no formal education?" Subedi asks. There are no direct translations for such terms in everyday Nepali language. "If I used jargon, someone like my granny wouldn't connect with it," he adds.

Instead of using technical terms, Subedi's song describes how the movement of rocks beneath the Earth triggers quakes. He embraces simplicity, crafting lyrics that are easy to understand and sing along to — an approach that ultimately captured widespread attention. For example, one verse states: "To this day, science has not determined when or how big an earthquake will be, or where exactly it will strike." The song's catchy refrain reinforces the message: "Just as you learn A-B-C, everyone can learn how to prepare to survive an earthquake."

Subedi's team wanted to shoot a music video for the song, using a school setting to engage students and create a ripple effect: the idea was that children and teenagers would watch the video and discuss the message with their parents and grandparents, spreading awareness throughout their communities. The music video highlights simple but crucial topics, including how earthquakes originate, building earthquake-resistant homes, how to prepare for an earthquake and how to behave during one.

https://www.youtube.com/watch?v=ymE-lrAK0TI&t=12s

(Saugat Bolakhe / nature, 24 March 2025, https://www.nature.com/articles/d41586-025-00919-1)

The 2025 quake heard 'round the engineering world

Building codes, government oversight and design choices will be reconsidered in coming months globally

On Monday, the Myanmar March 28 earthquake news cycle continued. This time, it was reported that the Bangkok skyscraper that the Bangkok highrise that collapsed during the 7.7-magnitude quake had construction irregularities and used substandard steel, according to a Thai watchdog agency.

Aftershocks from the quake that devastated Myanmar and rattled Thailand will reverberate for years. The immediate emergency has engineers scrambling, but engineers not on the ground are also contemplating possible repercussions for building locally and globally. Here are things to consider in Myanmar and Thailand, as well as California, Bangladesh, the Philippines, Kenya and other countries that live on fault lines or aren't anywhere near them.

US (California)

Friday's earthquake in Myanmar occurred on a continental transform fault called the Sagaing Fault, which is 62 miles wide and a fairly straight 750 miles long. California's San Andreas Fault is the same length and runs vertically along the state.

This design makes an associated earthquake especially destructive, says Rebecca Bell, a tectonics reader at the Imperial College London.

"The straight nature means earthquakes can rupture over large areas- and the larger the area of the fault that slips the larger the earthquake. … Earthquakes on transform faults within continents can be particularly destructive as the earthquake rupture can be very shallow, causing a lot of shaking at the surface, and their continental nature means population centers can be located very close to the fault," Bell says.

Myanmar

Californians are accustomed to conversations about seismically resilient construction, but the same isn't the case in some parts of Asia. While Myanmar is prone to earthquakes, the quake isn't the only factor when considering associated damage and a cultural understanding of such damage, says Senior Lecturer Ian Watkinson from the Department of Earth Sciences at Royal Holloway, University of London.

"During all previous magnitude 7 or larger earthquakes along the Sagaing Fault, Myanmar was relatively undeveloped, with mostly low-rise timber-framed buildings and brick-built religious monuments. But during the 20th century, there has been substantial development, especially in major cities.

"In 2012 there was a magnitude 6.8 earthquake about 120 km north of Mandalay, which affected relatively small villages and towns. Despite the moderate size of the earthquake, still there was substantial damage and 26 people died," Watkinson says.

Friday's quake, however, tested Myanmar's new, modern infrastructure.

Watkinson says the most vulnerable in Myanmar include those in or near reinforced concrete structures, In or near buildings made of brick, Near the banks of the Ayerwaddy River and in less accessible rural areas.

Thailand

Bangkok's earthquake awareness among engineers may be worse. A year ago, Suchatvee Suwansawat, a civil engineering professor at King Mongkut University and a former Council of Engineers Thailand president, came to lecture on the topic, but was disappointed in the level of interest locally. Suwansawat says the 33-story, under-construction building that collapsed shouldn't have.

Most of Thailand's buildings withstood the quake, perhaps due to its building code, updated in 2007 to include Bangkok and then again in 2009 to be more comprehensive, though it lacked detailed seismic design rules. Some engineers are calling for further upgrades and oversight.

While Bangkok doesn't sit on an active fault, soft soil allows things built on it to shake relatively easily, says Christian Málaga-Chuquitaype, senior lecturer at the Department of Civil and Environmental Engineering, Imperial College London.

Málaga-Chuquitaype adds that developers in Thailand often use post-tensioning, slender columns and flat slab construction for tall buildings. Like a table with four legs, flat slab design dispenses with horizontal support.

"While this design has cost and architectural advantages, it performs poorly during earthquakes, often failing in a brittle and sudden (almost explosive) manner," as evidenced in the video of the Thai building collapse, he says.

Su Su Nwal, president of the Thailand Section of the American Society of Civil Engineers, reported that many Bangkok high-rises suffered cracks and plaster falling.

Bangladesh

On the opposite side of Myanmar, Bangladesh officials considered its earthquake resilience options. Bangladesh's Institute for Planning and Development warns that most of the nation's cities are unprepared for earthquakes, citing widespread building code violations and poor urban planning. IPD urges 10 actions, including building retrofitting, comprehensive land-use planning, emergency shelter creation and code enforcement.

Philippines

Friday's quake reverberated throughout Asia, including in the Philippines. In reaction to Friday's quake, Philippine Senate President Francis Escudero on Monday called for new inspections of public and private infrastructure and buildings. The nation's building code lacks quake-specific provisions, Escudero says. Several bills that seek to standardize and strengthen inspections have recently advanced in the Senate.

Kenya

No one seems immune, though some nations are becoming proactive.

A week ago in Kenya, updates to the nation's circa 1968 building code went into effect. It's more comprehensive and less prescriptive to better enable the use of new materials and solutions, according to the National Construction Authority. It also increases penalties for noncompliance.

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(Jaan vanValkenburgh / SmartBrief Infrastructure – ASCE, 03/31/25, https://www.smartbrief.com/original/the-2025-quake-heard-round-the-engineering-world)

ΕΝΔΙΑΦΕΡΟΝΤΑ - ΓΕΩΛΟΓΙΑ

Mount Roraima: The 'lost world' isolated for millions of years that Indigenous people call the 'house of the gods'

Mount Roraima is a flat-topped formation with crystal-clear pools, waterfalls and a unique ecosystem that has been isolated from the surrounding savanna for millions of years.

Mount Roraima is often surrounded by clouds, making it look like a floating island. (Image credit: Martin Harvey/Getty Images)

QUICK FACTS

Name: Mount Roraima

Location: Tripoint between Venezuela, Brazil and Guyana

Coordinates: 5.131793939771963, -60.758709443048986

Why it's incredible: The mountain looks like a floating island from the sky.

Mount Roraima is a plateau with near-vertical sides that sits on the triple border point between Brazil, Venezuela and Guyana. The plateau is often encircled by a ring of clouds, which makes the summit look like an island floating in the sky.

The mountain towers 9,219 feet (2,810 meters) above the surrounding savanna, jutting out like a giant tabletop. Geologists call this kind of formation a "tepui," which means "house of the gods" in the language of the Pemon, the local Indigenous people. The Pemon believe tepuis to be sacred, and that Mount Roraima is the stump of a supernatural tree that held all the fruit and vegetables of the world until a mythical figure named Makunaima felled it, according to the International Business Times.

But scientists have another explanation for how Mount Roraima came to be. Tepuis are exclusively found in South America, and specifically in Venezuela and western Guyana, where they number more than 100. According to the Geological Society of London, tepuis are the remnants of a huge block of sandstone that formed in this region around 1.8 billion years ago as large sand dunes slowly solidified into rock.

Over the next 1.5 billion years, other types of rock accumulated on top of the sandstone, but these layers were eroded away roughly 180 million years ago, according to the Geological Society. Wind and water then went to work on the sandstone, carving out the giant, steep-sided plateaus we see today, according to Geology Science. Finally, geologic uplift raised the plateaus to their current height, according to Geology Science.

Like other tepuis, Mount Roraima's summit harbors a "lost world" ecosystem that has been sheltered from the surrounding region for about 70 million to 90 million years, according to a 2012 study.

The summit of Mount Roraima harbors a rare ecosystem. (Image credit: robertharding/Alamy)

Much remains unknown about the way that tepui ecosystems have assembled and evolved, but researchers estimate that a high proportion of the flora and fauna on the summits are endemic, meaning that they aren't found elsewhere. For example, about one-third of the vegetation found at the top of all tepuis, including carnivorous plants and orchids, is endemic, according to the World Wildlife Fund.

However, the 2012 study found that these ecosystems aren't completely isolated. The researchers analyzed the DNA of four tree frog species living on separate tepuis to determine whether these species have had any contact with each other in the past 70 million years. The scientists discovered that the frogs shared a common ancestor as recently as 5.3 million years ago, suggesting that tree frogs — and perhaps other creatures as well — can migrate up and down the cliffs of tepui formations.

Rare nectar-sucking birds and other unusual creatures, such as the Roraima black frog (*Oreophrynella quelchii*), thrive at the top of Mount Roraima thanks to pools of crystal-clear water and streams that feed waterfalls down the tepui's sides. These cascades are fed by rainwater and include the Crystal Valley Falls and Triple Point Falls.

Mount Roraima's summit and its incredible views are accessible to tourists, but ascending to the top requires a multi-day trek through challenging terrain, according to Geology Science.

(Sascha Pare / LINESCIENCE, 7.03.2025, https://www.livescience.com/planet-earth/geology/mount-roraima-the-lost-world-isolated-for-millions-of-years-that-indigenous-people-call-the-house-of-the-gods)

What's the oldest lake on Earth?

The oldest lake in the world dates back about 25 million years and is also the world's deepest and most biologically diverse lake.

Lake Baikal is 25 million years old, making it the oldest lake on Earth. (Image credit: Tatyana Andreyeva via Shutterstock)

Just like the mountains, lakes on Earth can be ancient, or more than 1 million years old. There are only 20 ancient lakes on the planet, but which is the oldest?

Earth's oldest lake has a clear winner: Lake Baikal in southeast Siberia. Scientists estimate that this enormous freshwater body is 25 million years old, according to Ted Ozersky, an associate professor of biological limnology (the study of inland bodies of water) at the University of Minnesota. By contrast, the Great Lakes formed less than 20,000 years ago. The second oldest lake on Earth is Lake Issyk-Kul in Kyrgyzstan, which formed about 20 million years ago.

Lake Baikal measures 12,239 square miles (31,700 square kilometers), making it Earth's seventh-largest lake. It is not only the world's oldest lake but also the deepest one, at about 1 mile (1.6 kilometers). But that's just the water depth. "The actual basin is much more than a mile deep," Ozersky told Live Science, including between 3.1 and 4.3 miles (5 to 7 km) of sediment at the bottom. In the case of Lake Baikal, where there are miles of sediment, researchers use seismic surveys to estimate the average rate of sediment formation, Ozersky said.

This sediment is key to dating the lake. Researchers measure a lake's age through isotopic dating. This technique involves measuring the ratios of radioactive isotopes. In this case, limnologists analyze lake sediments for radioactive versions of cesium, lead and carbon. This analysis tells them how old the different layers of sediment are and how fast that sediment accumulates, Ozersky explained

By understanding lake formation — and Lake Baikal's formation, in particular — researchers can get a better idea of how it has persisted for millions of years. Many lakes form as glacial features, Mark Edlund, a senior scientist and the director of aquatic research and collections at the Science Museum of Minnesota, told Live Science. Glaciers score a pocket in the landscape and deposit chunks of ice that eventually melt and fill the depression. "But in the grand scheme, they're very short-lived systems," Edlund said.

On the other hand, Lake Baikal is a rift lake. Rift lakes form when two continental plates start moving away from each other, creating a chasm. This chasm is called a graben. As these plates continue to drift apart, the graben continues to deepen. "As a result, that site never fills in," Edlund said, which is why rift lakes can last so long.

(Elana Spivack / LIVESCIENCE, 17 Mar 2025, https://www.livescience.com/planet-earth/whats-the-oldest-lake-on-earth)

Για τη δημιουργία Ηφαιστειολογικού Ινστιτούτου – Παρατηρητηρίου στην Ελλάδα

Το ηφαίστειο της Σαντορίνης Eurokinissi

Η δημιουργία ενός Ηφαιστειολογικού Ινστιτούτου – Παρατηρητηρίου δεν είναι εύκολη υπόθεση, αν δεν ξεπεραστούν υπαρκτά εμπόδια, όπως η γραφειοκρατία, η μεμψιμοιρία, τα τεχνικά, οικονομικά και ανθρώπινα προβλήματα. Γράφει ο ομότιμος Καθηγητής Γεωλογίας ΑΠΘ Σπύρος Παυλίδης.

*«**Ο πολιτισμός υπάρχει με γεωλογική συναίνεση, υπόκειται σε αλλαγές χωρίς προειδοποίηση**». Will Durant (Αμερικανός Ιστορικός, 1885–1981])*

Ζήσαμε και ζούμε ακόμη σε ύφεση μια **ασυνήθιστη ηφαιστειο-τεκτονική κρίση**, πρωτόγνωρη όπως χαρακτηρίστηκε, στη σεισμογενή χώρα μας. **Για πρώτη φορά επίσης αναγνωρίζεται και ως υπαρκτός ο ηφαιστειακός κίνδυνος**. Η πατρίδα μας, δημιούργημα της ενιαίας ηπειρωτικής ξηράς, της Αιγηίδας, διαμορφώθηκε από σεισμούς, ρήγματα, ηφαίστεια, αλλά και την αργή γλυπτική της διάβρωσης. Έτσι γεννήθηκαν και διαμορφώθηκαν στο διάβα του γεωλογικού και ιστορικού χρόνου, τα πολλά νησιά και νησίδες, οι πολύποίκιλες ακτές και τα ψηλά βουνά με τις απότομες ορθοπλαγιές, τα φαράγγια και οι κοιλάδες, διαμορφώνοντας τον όμορφο και μοναδικό αυτόν τόπο.

Η χώρα μας δεν είναι ένα τοπίο, αλλά πολλά και διαφορετικά. Σ' αυτά ακούμπησε η ψυχή του λαού μας που έζησε, δημιούργησε και επιβίωσε για χιλιάδες χρόνια. Επειδή τα θεμέλια μας είναι στα βουνά και τις θάλασσές μας, αυτή η γη πρέπει να προσεχτεί και να προστατευτεί, τόσο γεωλογικά, όσο περιβαλλοντικά και αισθητικά.

Ο ηφαιστειακός κίνδυνος και τα θαλάσσια σεισμογενή κύματα (τσουνάμι) απειλούν ανθρώπινες ζωές και το εύθραυστο τουριστικό προϊόν της χώρας. Σήμερα είναι επιτακτική ανάγκη, στο πλαίσιο ακόμη μιας ακραίας φυσικής απειλής, να δημιουργηθεί άμεσα ένα κρατικό ηφαιστειολογικό ερευνητικό κέντρο, παρακολούθησης των ενεργών ηφαιστείων του Αιγαίου, με ερευνητική και επιχειρησιακή αρμοδιότητα. Η δημιουργία του δεν είναι εύκολη υπόθεση, αν δεν ξεπεραστούν υπαρκτά εμπόδια, όπως η γραφειοκρατία, η μεμψιμοιρία, τα τεχνικά, οικονομικά και ανθρώπινα προβλήματα. **Χρειάζεται όμως μια γενναία πολιτική απόφαση**. Πρότυπα με παράδοση και υποδειγματικές υποδομές υπάρχουν στα ευρωπαϊκά κράτη, π.χ. Ιταλία, Γαλλία, Ισπανία, Ισλανδία και σε άλλες χώρες, ΗΠΑ, Ρωσία, Ιαπωνία, Ινδονησία, Φιλιππίνες, Γουατεμάλα (βλ. The World Organization of Volcano Observatories – WOVO).

Υπάρχει όμως και ένα ελληνικό υπόδειγμα, το **Ινστιτούτο Μελέτης και Παρακολούθησης του Ηφαιστείου Σαντορίνης** (ΙΜΠΗΣ), αναγνωρισμένο από το EuroVolc, που επιβιώνει για 30 χρόνια με τη στήριξη της τοπικής κοινωνίας και των πανεπιστημίων, τις προσπάθειες μεμονωμένων ή μικρών ομάδων επιστημόνων και ιδιωτών. Η Σαντορίνη είναι το πιο εν-

εργό ηφαίστειο της χώρας, κατάλληλος χώρος για την εγκατάσταση και λειτουργία του, με υπαρκτό δίκτυο υποδομής και αρχεία διαχρονικών καθημερινών καταγραφών. Ένα τέτοιο Ινστιτούτο, όταν δημιουργηθεί, θα συνδεθεί με τα αντίστοιχα τμήματα των ελληνικών και ξένων πανεπιστημίων και αντίστοιχων ερευνητικών κέντρων, από τα οποία θα μεταφέρει εμπειρία και τεχνογνωσία. Θα μπορέσει να συνενώσει και να συντονίσει τους διάσπαρτους ειδικότερους επιστήμονες παρατηρητές-ερευνητές. Ας μην ξεχνάμε ότι οι ηφαιστειακές εκρήξεις, αντίθετα από τους σεισμούς, μπορούν να προβλεφθούν όταν υπάρχουν δίκτυα παρακολούθησης σε καθημερινή βάση μετρήσεων.

Όλες οι πολιτισμένες χώρες με ενεργά ηφαίστεια, αναπτυγμένες και αναπτυσσόμενες, διαθέτουν πολύ καλά οργανωμένα ηφαιστειολογικά επιστημονικά κέντρα και παρατηρητήρια. Είναι καιρός, έστω και πολύ καθυστερημένα, να δημιουργηθεί και στη χώρα μας.

Η γεωλογία, σήμερα αναφερόμαστε στις γεωεπιστήμες, είναι βασική και θεμελιώδης επιστήμη με πάρα πολλές εφαρμογές. Αναπτύχθηκε δυναμικά κατά τον 19ο και 20ο αιώνα και συνέβαλε ουσιαστικά στη βιομηχανική επανάσταση και οικονομική ανάπτυξη. Δυστυχώς σήμερα στον 21ο αιώνα, στην εποχή της ραγδαίας τεχνολογικής επανάστασης, παρά την αλματώδη ανάπτυξη και διεπιστημονικότητά τους οι γεωεπιστήμες δεν έχουν τη αρμόζουσα προσοχή, ιδιαίτερα στη χώρα μας, στο αναγνωρισμένο διεθνώς, φυσικό γεωλογικό εργαστήριο, αφού έχουν εξοστρακιστεί ακόμη και από τη Μέση Εκπαίδευση, από τη μόρφωση των αυριανών πολιτών.

Επειδή βρισκόμαστε ακόμη μια φορά σε μια γεωλογική κρίση, ηφαιστειακή και σεισμοτεκτονική, μεταξύ πολλών άλλων κρίσεων, όπως κλιματική, υδροπενία, ρύπανση, πλημμύρες, κατολισθήσεις, είναι ανάγκη να ξαναπροσέξει η χώρα τα γεωλογικά φαινόμενα με άμεση προτεραιότητα τον ηφαιστειακό κίνδυνο.

Ο Σπύρος Παυλίδης είναι ομότιμος Καθηγητής Γεωλογίας ΑΠΘ και μέλος του ΔΣ του ΙΜΠΗΣ

(NEWS24|7, 27 Μαρτίου 2025,
https://www.news247.gr/perivallon/gia-ti-dimiourgia-ifaisteiologikou-institoutou-paratiritiriou-stin-ellada/)

ΕΝΔΙΑΦΕΡΟΝΤΑ - ΠΕΡΙΒΑΛΛΟΝ

Research on vanishing coastlines in Egypt offers solutions for protecting coastal cities, including those in California

Alexandria's coastline has undergone significant changes, with the western and eastern shores retreating dramatically between 1935 and 2022. Credit: Essam Heggy and Sara Fouad

A new USC study reveals a dramatic surge in building collapses in the ancient Egyptian port city of Alexandria, directly linked to rising sea levels and seawater intrusion.

Once a rare occurrence, building collapses in Alexandria—one of the world's oldest cities, often called the "bride of the Mediterranean" for its beauty—have accelerated from approximately one per year to an alarming 40 per year over the past decade, the researchers found.

"The true cost of this loss extends far beyond bricks and mortar. We are witnessing the gradual disappearance of historic coastal cities, with Alexandria sounding the alarm. What once seemed like distant climate risks are now a present reality," said Essam Heggy, a water scientist at the USC Viterbi School of Engineering and the study's corresponding author.

"For centuries, Alexandria's structures stood as marvels of resilient engineering, enduring earthquakes, storm surges, tsunamis and more. But now, rising seas and intensifying storms—fueled by climate change—are undoing in decades what took millennia of human ingenuity to create," said Sara Fouad, a landscape architect at the Technical University of Munich (TUM) and the study's first author.

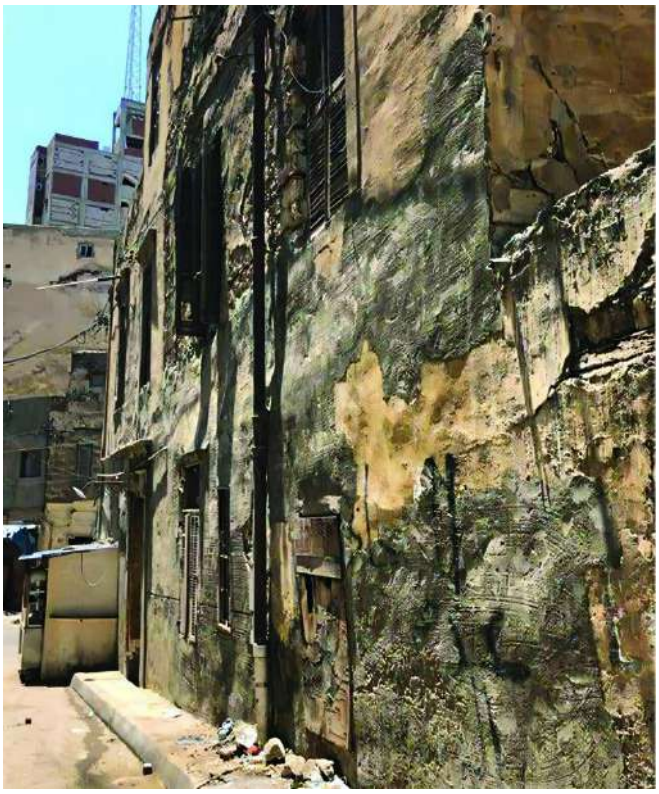
Coastal erosion: Sinking cities and rising seas

Even small sea level increases—just a few centimeters—can have devastating effects, Heggy said, threatening even cities as historically resilient as Alexandria, which has withstood centuries of earthquakes, invasions and fires, and even a modern metropolis like Los Angeles, where flash floods and mudslides are now complicating recovery from the recent wildfires.

Published in *Earth's Future*, the study coincides with troubling findings from NASA and NOAA showing that parts of California—including the San Francisco Bay Area, Central Valley and coastal Southern California—are sinking. These minor elevation changes can significantly heighten flood risks and saltwater intrusion, scientists warn.

Like Alexandria, California's coastal cities face growing threats from saltwater intrusion, which weakens infrastructure, degrades water supplies and drives up the cost of living.

"Our study challenges the common misconception that we'll only need to worry when sea levels rise by a meter," Heggy said. "However, what we're showing here is that coastlines globally, especially Mediterranean coastlines similar to California's, are already changing and causing building collapses at an unprecedented rate."



In the historic coastal districts of Alexandria, buildings are sinking as rising groundwater seeps up from below. Credit: Essam Heggy and Sara Fouad

Tracking coastal erosion in Alexandria, Egypt

The researchers used a three-pronged approach to assess the impact of shoreline changes on Alexandria's buildings.

First, they created a detailed digital map using geographic information system technology to identify the locations of collapsed buildings across six districts of the city's historic urban area, one of its most densely populated regions.

The map catalogs key details about each structure, including its location, size, construction materials, age, foundation depth and number of floors.

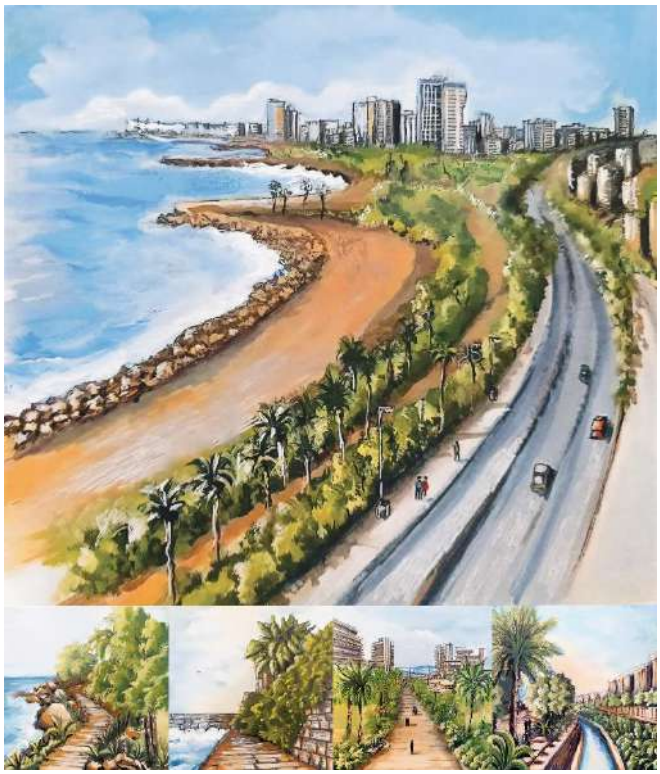
The data, collected from site visits, government reports, news archives and statements from private construction companies, spans 2001 to 2021 and includes both fully and partially collapsed buildings.

Next, they combined satellite imagery with historical maps from 1887, 1959 and 2001 to track shoreline movement and gain a deeper understanding of how parts of Alexandria's 50-mile coastline have moved tens of meters inland over the past two decades.

By calculating the rate of shoreline retreat over the past century, the researchers studied how the shrinking coastline is raising groundwater levels, bringing them into contact with the foundations of coastal buildings.

Finally, the team analyzed chemical "fingerprints" known as isotopes in soil samples to examine the effects of seawater intrusion. They measured specific isotopes, like B7, in each sample to assess the soil's mechanical properties. Higher B7 levels indicate stronger, more stable soil, while lower levels suggest erosion.

"Our isotope analysis revealed that buildings are collapsing from the bottom up, as seawater intrusion erodes foundations and weakens the soil. It isn't the buildings themselves, but the ground underneath them that's being affected," said Ibrahim H. Saleh, a soil radiation scientist at Alexandria University and one of the study's co-authors.



Developing waterways helps the city handle climate extremes and connects people to well-maintained urban spaces, linking the inner city to the coast. The strategy for future coastal resilience in Alexandria includes maintaining, enhancing or restoring a green belt along the coastline. Credit: Essam Heggy and Sara Elsayed

Developing waterways helps the city handle climate extremes and connects people to well-maintained urban spaces, linking the inner city to the coast. The strategy for future coastal resilience in Alexandria includes maintaining, enhancing or restoring a green belt along the coastline.

"Our study demonstrates that coastal buildings are at risk of collapsing even without directly encroaching on the seawater as widely believed," Heggy added.

A nature-based solution to protect coastal cities

To combat coastal erosion and seawater intrusion, the researchers propose a nature-based solution: creating sand dunes and vegetation barriers along the coastline to block encroaching seawater and hence preventing seawater intrusion from pushing up groundwater levels to building foundations.

This sustainable, cost-effective approach can be applied in many coastal densely urbanized regions globally, said Steffen Nijhuis, a landscape-based urbanist from Delft University of Technology in the Netherlands and study co-author.

"Preserving the diverse architectural attributes of Mediterranean historic cities is a powerful reminder of how landscape transformation has played a crucial role in creating climate-resilient societies," said Udo Weilacher, landscape architect at TUM and study co-author.

"Historic cities like Alexandria, which represent the cradle of cultural exchange, innovation and history, are crucial for safeguarding our shared human heritage," Heggy said.

"As climate change accelerates sea level rise and coastal erosion, protecting them isn't just about saving buildings; it's about preserving who we are."

More information: Sara S. Fouad et al, Soaring Building Collapses in Southern Mediterranean Coasts: Hydroclimatic Drivers & Adaptive Landscape Mitigations, *Earth's Future* (2025). DOI: 10.1029/2024EF004883

Journal information: *Earth's Future*

Provided by University of Southern California

(Nina Raffio, University of Southern California / PHSY.ORG, February 21, 2025, https://phys.org/news/2025-02-coastlines-egypt-solutions-coastal-cities.html)

Soaring Building Collapses in Southern Mediterranean Coasts: Hydroclimatic Drivers & Adaptive Landscape Mitigations

Sara S. Fouad, Essam Heggy, Oula Amrouni, Abderraouf Hzami, Steffen Nijhuis, Nesma Mohamed, Ibrahim H. Saleh, Seifeddine Jomaa, Yasser Elsheshtawy, Udo Weilacher

Abstract

The low-lying, arid coastal regions of the Southern Mediterranean Basin, extending over 4,600 km, face daunting sea level rise and hydroclimatic changes due to shifting weather patterns. The impact of these factors on coastal urban buildings and infrastructure must be better understood. Alexandria, a historic and densely populated port city in Egypt representative of several coastal towns in the Southern Mediterranean, has experienced over 280 building collapses along its shorelines over the past two decades, and the root causes are still under investigation. We examine the decadal changes in coastal and hydroclimatic drivers along the city's coastline using photogrammetric satellite images from 1974 to 2021. We explore the interconnectivity between shoreline retreat, ground subsidence, and building collapses. Our results suggest that collapses are correlated with severe coastal erosion driven by sediment imbalances resulting from decades of inefficient landscape management and urban expansion along the city's waterfront. This severe erosion, combined with sea level rise, increases seawater intrusion, raising groundwater levels in coastal aquifers. Degrading ground stability and accelerating corrosion in building foundations ultimately culminating in collapses. We identified a coastal area of high vulnerability with over 7,000 buildings at risk, surpassing any other vulnerable zone in the Mediterranean Basin. We propose cost-effective and nature-based techniques for coastal landscape adaptation to alleviate these dangers in Alexandria and other Southern Mediterranean cities facing similar climatic challenges.

Key Points

- Collapses of coastal buildings increased ten-fold over the last 20 years in the historic Mediterranean port city of Alexandria, threatening 7,000 buildings

- Collapses correlate with areas undergoing chronic and severe shoreline erosion and sea level rise, accelerating seawater intrusion in coastal aquifers
- Seawater intrusion uplifts the coastal groundwater levels to reach building foundations, accelerating their corrosion and collapse

Plain Language Summary

We examine the reasons for the rise in structural failures of buildings along the 70 km coastline of the ancient port city of Alexandria in the Southern Mediterranean. The city is internationally recognized for its significant susceptibility to sea level rise. Severe shoreline retreat due to coastal erosion and rising sea levels significantly accelerates seawater intrusion in coastal aquifers, compromising ground mechanical qualities and degrading building foundations. This ultimately results in their failure. Over 7,000 structures adjacent to the old city coastline are at risk of collapse, rendering it the most climate-vulnerable metropolitan sector in the Mediterranean region. Comparable tendencies are noted in other coastal cities in emerging nations undergoing recent hydroclimatic alterations and where mitigation plans have yet to be enacted. We propose cost-effective and nature-based techniques for coastal landscape adaptation to alleviate these dangers in Alexandria and other cities in emerging nations facing similar climatic challenges.

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First published: 12 February 2025

AGU ADVANCING EARTH AND SACE SCIENCES/ Eath's Future, Volume13, Issue2, February 2025,
https://doi.org/10.1029/2024EF004883,
https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2024EF004883

Protect structures from flood risks with new ASCE standard

A new ASCE standard establishes minimum requirements for building structures in high-risk flood areas.

Resilient design is the first line of defense against natural disasters. Civil engineers want to cover all the bases, and a new standard aims to prepare structures for one of nature's most destructive events: flooding.

Flood Resistant Design and Construction, ASCE/SEI 24-24, establishes minimum requirements for building structures in high-risk flood areas. This comprehensive guide specifies minimum construction standards in flood hazard areas, lists materials for building flood-resistant structures, and incurporates requirements of the National Flood Insurance Program and FEMA.

The ASCE Structural Engineering Institute ASCE 24 Flood Resistant Design and Construction Standards Committee took on the challenge of creating the new standard, an updated version of ASCE/SEI 24-14. Jessica Mandrick, P.E., S.E., M.ASCE, vice chair of the ASCE 24 Committee, discussed the standard and how it will impact the construction of flood-resistant infrastructure with Civil Engineering Source.

Civil Engineering Source: What inspired the creation of ASCE/SEI 24-24? Were there any specific events that brought the need for this standard to light?

Jessica Mandrick: The standard had not been updated since ASCE 24-14 came out in 2014. ASCE 24-24 became urgently needed when ASCE 7-22 Supplement 2 was published in 2023. ASCE 7-22 Supplement 2 raised the mean recurrence interval for the flood level that is used to determine flood loads, with the average building now designed to resist the loads imposed by the 500-year flood.

To reduce the loads imposed on a structure and also reduce damage to its contents, it was critical to raise the elevation of buildings correspondingly. The standard now specifies building elevation based on a mean recurrence interval determined by the buildings Flood Design Class, which is similar to its Risk Category. We also moved elevation requirements that were spread throughout the standard to one consistent location. There were also many updates in FEMA Technical Bulletins and the standardization of ANSI/FM 2510 in the past 10 years that the standard was able to pick up.

Source: What did the process of creating this new standard look like?

Mandrick: We were fortunate to have the support of FEMA in this effort. Their data analysis helped to distill varying elevations all over the country into formulas that could appropriately approximate the flood elevation for different MRIs. They were joined by academics, industry representatives, practitioners, and building officials in this study to refine the formulas and methods as well as estimate costs and loss reduction. Industry representatives gave feedback on flood vent and barrier products currently on the market and testing available through ANSI/FM 2510. The committee used this data along with the availability of certified products in the market to identify where such testing is required.

Source: Which changes do you think will have the most significant impact on flood-resistant infrastructure?

Mandrick: For building type-projects, raising the elevation of the lowest floor will reduce flood risk and protect investment in a structure. This will result in reduced damage to the structure and its contents.

(ASCE CIVIL ENGINEERING Source, 3/20/2025,
https://www.asce.org/publications-and-news/civil-engineering-source/article/2025/03/20/protect-structures-from-flood-risks-with-new-asce-standard)

ΝΕΕΣ ΕΚΔΟΣΕΙΣ ΣΤΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΠΙΣΤΗΜΕΣ

Construction of Roller Compacted Concrete Subbase

Austroads Technical Specification ATS 3540

Austroads Technical Specification ATS 3540 sets out the requirements for the construction of Roller Compacted Concrete to be used as a subbase under an asphalt base. It includes the requirements for:

- placement;
- compaction;
- trimming, where required; and
- curing

of Roller Compacted Concrete subbase.

PDF (free) Download

This technical specification can also be downloaded as a Word document

(Austroads, 14 February 2025, https://austroads.gov.au/publications/test-methods/ats-3540)

ΗΛΕΚΤΡΟΝΙΚΑ ΠΕΡΙΟΔΙΚΑ

International Journal of Geoengineering Case Histories

International Journal of Geoengineering Case Histories *19 Mar 2025*

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International Journal of Geoengineering Case Histories *26 Feb 2025*

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International Journal of Geoengineering Case Histories *25 Feb 2025*

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International Journal of Geoengineering Case Histories *20 Feb 2025*

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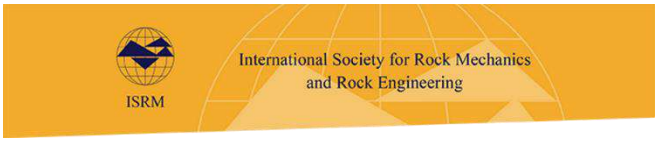

Κυκλοφόρησε το ISRM NEWS JOURNAL Volume 27 December 2024.

The 2024 issue of the ISRM News Journal is available on the website. It reports the ISRM activities in 2024 and presents technical articles.

You will find information about the Board and Council meetings, the President's and Vice President's reports on the ISRM activities, the Secretary-General's report on the evolution of ISRM National Groups and ISRM's membership in recent years, the awards, the reports of the Technical Oversight, Education Fund, Young Members and Communication Committees, the Online Lectures, the anual review, conference announcements and reports, and many other articles of interest for the rock mechanics community.

Six technical articles are included in this issue:

- the Franklin Lecture 2024 delivered by Dr Vikram Vishai from India;
- the Rocha Medal presentation by Dr Kazuki Sawayama from Japan, winner of the Rocha Medal 2024;
- the paper of the winner of the John Hudson Rock Engineering Award, Prof. Yufang Zhang from China;

- the paper of the winner of the Young Rock Engineer Award, Gabriel Walton, from the USA;
- the papers of the winners of the Science Achievement Award, Prof. Pinnaduwa H.S.W. Kulatilake from the USA and Prof. Weiren Lin from China.

Click here to read the News Journal directly on our website, or download it.

Κυκλοφόρησε επίσης το ISRM Newsletter No. 69 - Spring 2025 με τα ακόλουθα περιεχόμενα:

- EUROCK 2025: Final Countdown to the Conference!
- Richard Goodman 1935-2025
- Volume 26 - 2023 of the ISRM News Journal is online
- Presidential election for the 2027-2031 term of office - two candidates nominated
- ISRM Young Members' Seminar on the ISRM Young Members YouTube channel
- ISRM Workshop on Soft Rocks (ISRM-WSR2025) - bulletin No. 2
- Session on intergenerational dialogue in geotechnics at the 74th Geomechanics Colloquium
- ISRM Rocha Medal 2027 - nominations to be received by 31 December 2025
- ISRM Sponsored Conferences

https://s3.amazonaws.com/xcdshared/dfi/deep-foundations-magazine/mar-apr-25.pdf

Κυκλοφόρησε το τεύχος Μαρτίου / Απριλίου 2025 του περιοδικού Deep Foundations με τα ακόλουθα περιεχόμενα:

- Cover Story: Digging Deep in Washington, D.C.
- Paw Paw Slope Stabilization
- Overcoming Geological Challenges
- Foundation Reuse by Increasing the Bearing Capacity of Foundation Soil
- A Look Back: Frequency-variable Vibrators and their Application to Foundation Engineering
- Member Profile: For Engineer Chris Nelsen Sustainability is Foundational
- Foundations for a Sustainable Future: Research Advances for Bio-inspired Ground Improvement Alternative
- Risk Corner: The Hidden Cost: The Risk of Ignoring Mental Health in the Heavy Highway Construction Industry

INTERNATIONAL GEOSYNTHETICS SOCIETY

Κυκλοφόρησε το IGS Newsletter - March 2025 με τα ακόλουθα περιεχόμενα:

IGS Diversity Task Force Gains Committee Status

An IGS working group committed to improving inclusion and equity in the Society and wider geosynthetics industry has been upgraded into a Committee. Following its successful sessions at the 12ICG in Rome and GeoAmericas2024 in Toronto, the committee is planning similar sessions at GeoAsia8 and EuroGeo8 later this year. READ MORE

Next Fumio Tatsuoka Lecturer Announced

A lecture series celebrating geosynthetics advances in the Asia region has named Professor Chao Xu as its next honored speaker. Dr. Xu will present during the opening session of GeoAsia8. REGISTER; READ MORE

Early Bird Registration Extended: 15 April 2025

Early bird registration for EuroGeo8 has been extended through 15th of April. Take advantage of this opportunity and join us in Lille, France this September for Europe's leading geosynthetics event! REGISTER; READ BROCHURE

13th ICG Early Abstracts Acceptance Deadline Closing 31 March 2025

Present your ideas at one of the most significant global geosynthetics conferences in the IGS calendar by submitting your abstract and short course proposals by **31 March 2025**. READ MORE

13ICG Exhibition & Sponsorship News:

- **IGS Premium Corporate Members** Selection begins 1:00pm EDT March 21, 2025
- **IGS Corporate Members** Selection begins 8:00am EDT March 31, 2025

EXHIBITS AND SPONSORSHIPS

Corporate Members Invited to Showcase Projects at GeoAsia8

Don't miss the chance to showcase your projects on a global scale at GeoAsia8! Projects constructed in Asia from April 2022 to April 2025 are eligible for this edition of the Corporate Case Study Competition. Winner(s) will go on to compete in the Finals at the 13ICG in Montreal 2026. Submissions close on 2 May 2025. READ MORE

IGS Foundation Annual Report 2024 Released

The IGS Foundation (IGSF) marks another vigorous year of activity with the publication of its latest annual report. The report highlights the diverse initiatives the Foundation facilitated over 2024 as well offering a healthy financial picture as it progresses towards its goal of securing at least $500,000 in donations. READ MORE

10 Questions With…

Amir Shahkolahi Asian Regional Committee Chair

Viviana Mangraviti Young Member Committee Chair

IGS Romania

IGS Chapter News

High-Speed Railway Visit For China Delegates

Attendees of a seminar on the construction technology of geosynthetic reinforced walls (GRS) for railways observed work on the new Shanghai-Chengdu line in Yichang, Hubei Province, and had the opportunity to learn more about the project's GRS walls. READ MORE

Erosion And Mining Focus At IGS Brazil EtE

University teaching staff from the northern Brazil region benefited from a three-day IGS Educate the Educators (EtE) session. Lectures and case studies were complemented by two practical workshops, as well as visits to two manufacturing facilities in the region. READ MORE

Experts Gather For IGS Slovakia's National Conference

More than 60 specialists from Slovakia and other nations gathered for IGS Slovakia's national conference, Geosynthetics 2025. Known locally as Geosyntetika 2025, the event is held every two years at the University of Žilina and aims to share the latest findings from construction projects using geosynthetics. READ MORE

Waste Water Management Conference First For IGS Mexico

Widening knowledge about the use of geosynthetics in Mexico's mining sector was given a boost after IGS Mexico held its first such symposium. The Chapter welcomed delegates to the 1st International Symposium of Tailings Storage Facilities, held in Chihuahua, Mexico. READ MORE

Improving Safety And Reliability With Stabilising Geogrids

A geogrid-stabilised working platform has helped to ensure a major transport project stays on track in the UK.

Tensar InterAx geogrid solution has been used to construct a temporary working platform as part of the HS2 high-speed rail project from London to Birmingham. READ MORE

Upcoming Events

IGS UK Webinar

ISO TR18228 – Design Using Geosynthetics : What do the 10 parts mean? by Derek Smith – **26 March 2025**. REGISTER

IV Romanian Conference on Geosynthetics (GeoSint 2025)

Featuring a selection of the published papers and 4-6 keynote lectures delivered by specialists in the field of geosynthetics. **3 – 4 April 2025**, in Bucharest, Romania. READ MORE

IGS Australasia Hybrid Workshop

New Trends in Geomembrane Testing and Specifications – Introduction of GRI GM 42 for Geomembranes in Extreme Conditions by George Koerner **– 4 April 2025**. READ MORE

IGS North America Webinar

How Infrastructures Last Longer, Use Less Gravel and Emit Less Carbon: Geosynthetics & Water Management by Eric Blond **– 17 April 2025**. REGISTER

GeoAsia 8

Geosynthetics: pioneering lasting solutions for the Earth, explores the appropriate use and beneficial impact of geosynthetics on civil infrastructure and sustainability throughout Asia. **10-13 June 2025**, in Brisbane, Australia. www.geoasia8.org

EuroGeo 8

Technical Challenges and Environmental Imperatives for the 21st Century. The new challenges faced by construction professionals, environmental concerns, innovation and risk management will be at the heart of the discussions and presentations. **15-18 Sept 2025**, in Lille, France. www.eurogeo8.org

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