



The Giant's Causeway - Northern Ireland, UK

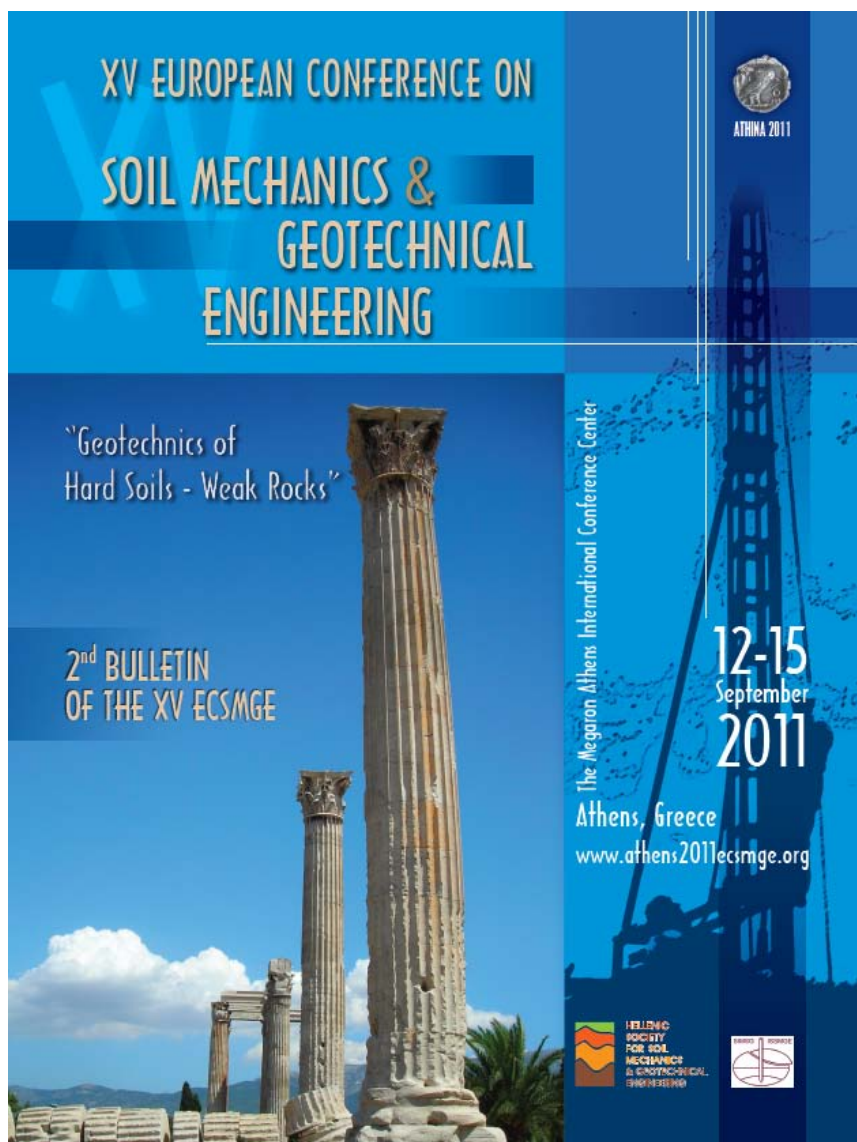


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ΕΠΙΣΤΗΜΟΝΙΚΗ  
ΕΤΑΙΡΕΙΑ  
ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ  
& ΓΕΩΤΕΧΝΙΚΗΣ  
ΜΗΧΑΝΙΚΗΣ

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## Όλη η Ελλάδα σε 50 βήματα

Του Γ. Μαλούχου

Ξαφνικά, φτάνει στο e-mail μια μικρή, αδιάφορη είδηση: Στον τιτάνιο αγώνα της χώρας τους να ξεπεράσουν τη βιβλική καταστροφή, κάποιοι Ιάπωνες μηχανικοί ξανάφτιαξαν έναν κατεστραμμένο αυτοκινητόδρομο σε 6 (!) ημέρες.

Φίλος αναγνώστης την έστειλε, μαζί με... τη συνέχειά της: ένα συγκριτικό με τα καθ' ημάς κείμενο. Σ' αυτό, η ζωή μας, που όλα μπερδεύονται με όλα και προκύπτει το χάος, προβάλλει ανάγλυφα σε όλο της το μάταιο μεγαλείο, σ' όποιο πεδίο μπορεί να φανταστεί κανείς. Ο συντάκτης αυτού του με εξαιρετικό χιούμορ κειμένου δεν αναφέρεται, αλλά μπράβο του!

Λησμόνησε πάντως δύο κομβικά, διαχρονικά σημεία: το "Στάδιο μηδέν", όπου το όποιας μορφής έργο / ανάθεση / σύμβαση / θέση σε κάθε τομέα δημόσιας χρηματοδότησης (δηλαδή περίπου παντού...) μπορεί να "μαγειρεύεται" σε προδιαγραφές και κόστος και ένα "διαρκές σημείο" που μπαίνει σε πολλά στάδια της διαδικασίας, το πάρε / δώσε της μίζας...

Έδωσε όμως μια ακτινογραφία όλης της Ελλάδας του "βουλιάζουμε" σε 50 βήματα, η οποία ακολουθεί αυτούσια και αξίζει να διαβαστεί μέχρι το τέλος...:

"Ηλίθιοι Ιάπωνες. Η ορθή διαδικασία είναι η ακόλουθη:

1. Σχεδιάζουμε έναν παρακαμπτήριο δρόμο για να εκτρέψουμε την κυκλοφορία όσο διάστημα θα διαρκούν οι εργασίες.
2. Προσέχουμε η χάραξη να είναι στενή και με αρκετές στροφές - μη σκοτωθεί κανένας από υπερβολική ταχύτητα!
3. Αλλάζουμε τη χάραξη γιατί η αρχική περνούσε από τον ελαιώνα του κοινοτάρχη.
4. Αναθέτουμε (μετά από διαγωνισμό βεβαίως, μη μας πούνε και τίποτα) 8 μελέτες σε 8 διαφορετικούς μελετητές.
5. Κηρύσσουμε απαλλοτριωτέα την έκταση.
6. Βγαίνει η δικαστική απόφαση απαλλοτρίωσης.
7. Οι ενδιαφερόμενοι καταθέτουν ενστάσεις γιατί η τιμή είναι χαμηλή.
8. Βγαίνει νέα δικαστική απόφαση με νέες, υψηλότερες τιμές.
9. Εφεσιβάλλουμε την απόφαση ενώπιον των δικαστηρίων.
10. Βγαίνει δευτεροβάθμια απόφαση που μοιράζει τη διαφορά στη μέση.

11. Εν τω μεταξύ, οι περιβαλλοντικές οργανώσεις προσβάλλουν τη μελέτη περιβαλλοντικών επιπτώσεων γιατί στην περιοχή εθεάθη ζεύγος σπουργιτιών με σπάνιο χρώμα φτερών (δύο τόνοι σκουρότερο καστανό από το κανονικό).
12. Χρειαζόμαστε χρήματα για καταβάλλουμε το κόστος των απαλλοτριώσεων. Λόγω δύσκολων καιρών, τοποθετούμε έναν νέο σταθμό διοδίων στην είσοδο της παρακαμπτηρίου.
13. Προκηρύσσεται δημόσιος διεθνής διαγωνισμός για την ανάληψη του έργου.
14. Αναδεικνύεται ο ανάδοχος.
15. Οι υπόλοιποι προσφεύγουν στα δικαστήρια για την ακύρωση του διαγωνισμού.
16. Το δικαστήριο βγάζει απόφαση και δικαιώνει τους προσφεύγοντες. Αφαιρεί το έργο από τον πρώτο και το δίνει στο δεύτερο της κατάταξης.
17. Ο πρώτος ανάδοχος προσφεύγει εκ νέου στα δικαστήρια.
18. Το δευτεροβάθμιο δικαστήριο δικαιώνει ξανά τον πρώτο και αφαιρεί το έργο από τον δεύτερο.
19. Στο μεταξύ ο πρώτος έχει πτωχεύσει και δεν μπορεί να το αναλάβει.
20. Ο δεύτερος αλλάζει προτεραιότητες και πλέον δεν το θέλει ούτε αυτός (σιγά μην κάτω ν' ασχοληθώ με παραγκιόζηδες σκέφτεται).
21. Το έργο κατακυρώνεται στον τρίτο, ο οποίος πρέπει πλέον να προσλάβει επείγοντως Αλβανούς, Πακιστανούς και λοιπές δημοκρατικές δυνάμεις για να το αναλάβει.
22. Ξεκινάμε τις χωματουργικές εργασίες στην παρακαμπτήρια.
23. Διακόπτουμε τις χωματουργικές εργασίες γιατί ανακαλύφθηκε ένα αρχαίο κτίσμα.
24. Επεμβαίνει η αρχαιολογική υπηρεσία για σωστικές ανασκαφές.
25. Σε συμβούλιο του ΚΑΣ αποφασίζεται ότι το κτίσμα ήταν ένα μαντρί της ελληνιστική περιόδου και δεν πειράζει αν καταχωθεί.
26. Συνεχίζονται οι χωματουργικές εργασίες.
27. Διακόπτονται οι χωματουργικές εργασίες γιατί μπήκαμε στο Ραμαζάνι και οι Πακιστανοί αρνούνται να εργαστούν.
28. Μετά το Μπαϊράμι συνεχίζονται οι χωματουργικές εργασίες.
29. Τελειώνουν οι χωματουργικές εργασίες και πλέον η παρακαμπτήρια είναι έτοιμη για ασφαλτόστρωση.
30. Εν τω μεταξύ όλοι οι οδηγοί έχουν ανακαλύψει αυτόν το δρόμο και τον χρησιμοποιούν, ασχέτως αν απαιτείται να κάνουν σλάλομ ανάμεσα στα μηχανήματα.
31. Οι εργασίες διακόπτονται γιατί ένα αγροτικό χτύπησε έναν Πακιστανό και οι ομοεθνείς του ξεσηκώνονται για την άνανδρη χριστιανική επίθεση σε αθώους μουσουλμάνους.
32. Στο χώρο προσέρχονται στελέχη του ΣΥΡΙΖΑ για συμπάρσταση στο δίκαιο αγώνα των Πακιστανών.
33. Οι Πακιστανοί πετυχαίνουν αύξηση των ημερομισθίων και επιστρέφουν στην εργασία τους.
34. Οι Αλβανοί απέχουν γιατί διαμαρτύρονται για την αύξηση των ημερομισθίων των Πακιστανών.
35. Οι Αλβανοί πετυχαίνουν κι αυτοί αύξηση του ημερομισθίου τους και επιστρέφουν στη δουλειά τους.
36. Οι εργασίες ασφαλτόστρωσης ολοκληρώνονται με την φυσιολογική καθυστέρηση των 28 μηνών.
37. Η παρακαμπτήρια οδός δίνεται στην κυκλοφορία.
38. Η παρακαμπτήρια οδός κλείνει γιατί διπλώσε μία νταλίκα.
39. Η νταλίκα μαζεύεται και η παρακαμπτήρια οδός ξανανοίγει.
40. Η συντονιστική επιτροπή του κινήματος "Δεν Πληρώνω" κάνει κατάληψη στα διόδια γιατί τα θεωρεί απαράδεκτα.
41. Η παρακαμπτήρια οδός κλείνει γιατί τώρα που τις μπάρες τις κρατάν ανοικτές οι "Δεν Πληρώνω" ένα κωλοφτιαγμένο Hyundai περνάει με ταχύτητα και παρασέρνει το κοπάδι πρόβατα του κυρίου Μήτσου που διασχίζει το δρόμο.
42. Τα αίματα και τα μέλη των προβάτων καθαρίζονται και η παρακαμπτήρια οδός ξανανοίγει.
43. Τα διόδια λειτουργούν και πάλι μετά από παρέμβαση των μονάδων της τάξης που ρίχνουν χημικά στους "Δεν Πληρώνω". Έτσι κι αλλιώς συνηθισμένοι είναι.
44. Η παρακαμπτήρια οδός κλείνει γιατί ο εργολάβος τοποθετεί τα μηχανήματά του στο δρόμο επειδή δεν έχει πληρωθεί για τη δουλειά του, η οποία τώρα κοστολογείται στο 360% του αρχικού προϋπολογισμού.
45. Τα MAT περιποιούνται και τον εργολάβο και η παρακαμπτήρια οδός ξανανοίγει.
46. Τώρα που λύθηκαν τα προβλήματα με την παρακαμπτήρια οδό, είναι ώρα να επισκευάσουμε και το δρόμο.
47. Επαναλαμβάνονται τα βήματα 1-45.
48. Εν τω μεταξύ, και επειδή έχουν περάσει πολύς καιρός, κανείς πλέον δεν θυμάται γιατί χάλασε ο δρόμος και αποφασίζεται να τον αφήσουν στην ησυχία του και να διαπλατύνουν τελικά την παρακαμπτήρια.
49. Μέχρι να διαπλατυνθεί η παρακαμπτήρια, έχει περάσει η περίοδος επανάληψης του σεισμού και ένας νέος σεισμός την καταστρέφει εντελώς.
50. Αποφασίζεται να χρησιμοποιηθεί ο παλιός αυτοκινητόδρομος ως παρακαμπτήρια της παρακαμπτήριας μέχρι να ολοκληρωθούν οι εργασίες αποκατάστασης. Και όλα κάνουν τον κύκλο τους..."



# ΤΙ ΑΛΛΟ ΚΑΝΟΥΝ ΟΙ ΓΙΑΠΩΝΕΖΟΙ

Περισσότεροι από διακόσιοι μηχανικοί, τεχνικοί και καθηγητές άνω των 60 ετών, αποφάσισαν να αναλάβουν τον καθαρισμό του εργοστασίου της Φουκουσίμα, προκειμένου να γλιτώσουν τους νέους εργαζόμενους από τους κινδύνους μόλυνσης από τα ραδιενεργά κατάλοιπα του κατεστραμένου εργοστασίου.

Το "Σώμα Εξειδικευμένων Βετεράνων", όπως αυτοαποκαλείται η ομάδα, αποτελείται κυρίως από συνταξιούχους πυρηνικούς τεχνικούς, οι οποίοι θα αναλάβουν και πάλι καθήκοντα μετά από αρκετά χρόνια συνταξιοδότησης. Ο Yasuteru Yamada, 72 ετών, μηχανικός και βασικό στέλεχος της νεοσύστατης ομάδας, θεωρεί ότι ήρθε ώρα η γενιά του να πάρει θέση στο θέμα και να κάνει κάτι γι αυτό. "Ακόμα και αν εκτεθούμε στη ραδιενέργεια," αναφέρει ο Yamada, "ο καρκίνος θα πάρει 20 με 30 χρόνια να αναπτυχθεί. Είμαι 72 ετών και προσωπικά δεν περιμένω να ζήσω περισσότερο από 12 με 15 χρόνια ακόμα, το πολύ". Το πλήρες άρθρο μπορείτε να το διαβάσετε στη συνέχεια και να βγάλετε τα συμπεράσματά σας για την ιαπωνική κοινωνία και πολλά άλλα, όπως το τί έφερε εμάς τους Έλληνες σε θέση να διανύουμε, πολιτισμικά, τη χειρότερη φάση της ζωής μας. Απλά, το ότι δεν έχουμε καμία σχέση με τις αξίες που πηγάζουν από τα παραπάνω.

**31 May 2011**

## **Japan pensioners volunteer to tackle nuclear crisis**

**By Roland Buerk, BBC News, Tokyo**

**A group of more than 200 Japanese pensioners are volunteering to tackle the nuclear crisis at the Fukushima power station.**

The Skilled Veterans Corps, as they call themselves, is made up of retired engineers and other professionals, all over the age of 60.

They say they should be facing the dangers of radiation, not the young.

It was while watching the television news that Yasuteru Yamada decided it was time for his generation to stand up.

No longer could he be just an observer of the struggle to stabilise the Fukushima nuclear plant.

The retired engineer is reporting back for duty at the age of 72, and he is organising a team of pensioners to go with him.

For weeks now Mr Yamada has been getting back in touch with old friends, sending out e-mails and even messages on Twitter.

Volunteering to take the place of younger workers at the power station is not brave, Mr Yamada says, but logical.

"I am 72 and on average I probably have 13 to 15 years left to live," he says.

"Even if I were exposed to radiation, cancer could take 20 or 30 years or longer to develop. Therefore us older ones have less chance of getting cancer."

Mr Yamada is lobbying the government hard for his volunteers to be allowed into the power station. The government has expressed gratitude for the offer but is cautious.

Certainly a couple of MPs are supporting Mr Yamada.

"At this moment I can say that I am talking with many key government and Tepco people. But I am sorry I can't say any more at this moment. It is on the way but it is a very, very sensitive issue politically," he said.

Certainly it is likely more workers will be needed.

The plant is still spewing radiation, nearly three months after an earthquake and tsunami knocked out its cooling systems, triggering explosions.

Its operator, Tepco, has now confirmed three of the reactors probably suffered meltdowns.

The plan is to bring the plant to a cold shutdown by January, although some experts believe that is over optimistic.

To cope with the disaster Japan has raised the radiation exposure limit for emergency workers from 100 millisieverts to 250 millisieverts.

But Tepco announced this week two workers at Fukushima might have already been exposed to more.

## **Kamikaze?**

Many of Mr Yamada's veterans are retired engineers like him.

Others are former power station workers, experts in factory design - and even a singer and two cooks - Mr Yamada says they will be useful to keep his team amused and fed.

Michio Ito used to be a primary school teacher but is spending his retirement helping out in a cafe that offers work experience to people with learning difficulties.

He is keen to swap his apron for a radiation suit.

"I don't think I'm particularly special," he says. "Most Japanese have this feeling in their heart. The question is whether you step forward, or you stay behind and watch."

"To take that step you need a lot of guts, but I hope it will be a great experience. Most Japanese want to help out any way they can."

Mr Yamada has already tried on his old overalls for size.

He says he is as fit as ever - with a lifetime of experience to bring to the task.

And he laughs off suggestions his proposed team is comparable to the kamikaze pilots who flew suicide missions in World War II.

"We are not kamikaze. The kamikaze were something strange, no risk management there. They were going to die. But we are going to come back. We have to work but never die."

# ΠΡΟΓΡΑΜΜΑ ΕΚΔΗΛΩΣΕΩΝ ΠΕΡΙΟΔΟΥ ΣΕΠΤΕΜΒΡΙΟΥ - ΔΕΚΕΜΒΡΙΟΥ 2011



ΕΛΛΗΝΙΚΗ  
ΕΠΙΣΤΗΜΟΝΙΚΗ  
ΕΤΑΙΡΕΙΑ  
ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ  
& ΓΕΩΤΕΧΝΙΚΗΣ  
ΜΗΧΑΝΙΚΗΣ

## «Geology, engineering and ground response to tunnelling»

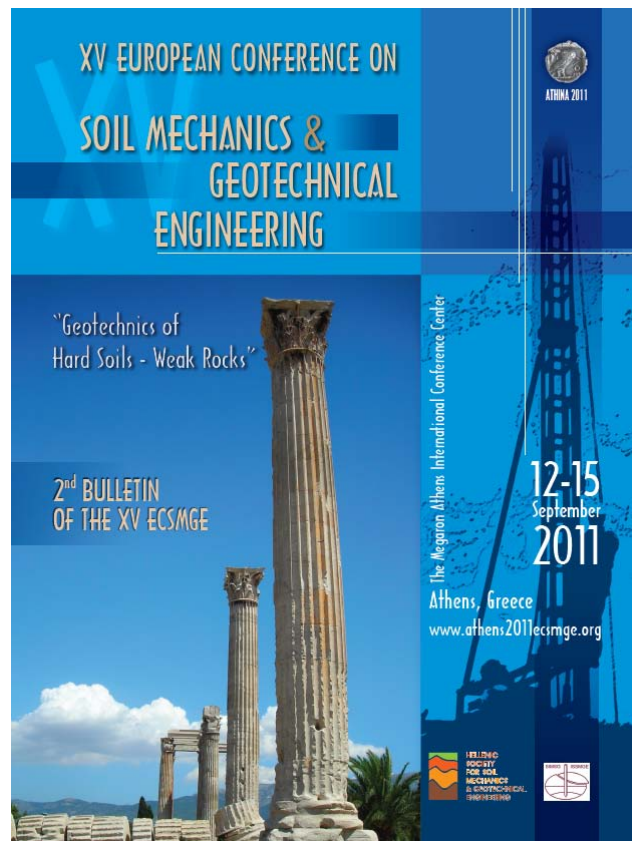
Η διάλεξη θα δοθή την Δευτέρα 5 Σεπτεμβρίου στην Αθήνα (στην αίθουσα εκδηλώσεων της Σχολής Πολιτικών Μηχανικών ΕΜΠ στην Πολυτεχνειούπολη Ζωγράφου, ώρα 19:00) από τον Jamie Standing, Πολιτικό Μηχανικό, Senior Lecturer in Geotechnical Engineering at Imperial College London.

### ΠΕΡΙΛΗΨΗ ΔΙΑΛΕΞΗΣ

Geotechnical Engineers clearly understand that geology plays a key role in their field. Frequently though, more subtle aspects of geology are overlooked. Detailed monitoring of the ground during the construction of tunnels for the Jubilee Line Extension and the Channel Tunnel Rail Link and equally detailed study of the ground conditions have revealed the significant influence of sub-units of the London Clay formation. The lecture will focus on the response of London Clay to tunnelling works – however it is important to recognise that similar ground features are extensively found in other strata. If the depositional environment of a soil is well understood along with any subsequent geological events, anticipating the ground conditions and their response to geotechnical processes can be greatly improved. Tunnelling-induced ground surface and subsurface responses in terms of displacements, strains and pore pressure changes will be presented and discussed in the context of the geology and the tunnelling method for both the short- and long-term condition.

### ΒΙΟΓΡΑΦΙΚΟ ΣΗΜΕΙΩΜΑ ΟΜΙΛΗΤΗ

Dr Standing is a Senior Lecturer in Geotechnical Engineering at Imperial College London. His main research activities are strongly linked to soil-structure interaction, including tunnelling, piling, embankments and ground reinforcement using soil nailing and the study of these process using full-scale field monitoring and small-scale laboratory models. He has published more than sixty journal and conference papers and was awarded the Géotechnique medal in 2006. He was co-editor of 'Building response to tunnelling: case studies from construction of the Jubilee Line Extension' that was published following the Imperial College research on the JLE project. He subsequently led a full-scale research project on the CTRL (to assess the effect of tunnelling on piled foundations) and has recently secured EPSRC funding to investigate the effect of tunnelling on existing tunnels in collaboration with the Crossrail project.



Κυκλοφόρησε το 2<sup>nd</sup> Bulletin του XV European Conference on Soil Mechanics and Geotechnical Engineering με λεπτομέρειες για την διοργάνωση του συνεδρίου, των συνεδρίων, των τεχνικών επισκέψεων κ.λπ. Σημειώνεται ότι έχουν εγκριθεί 380 περίπου περιλήψεις άρθρων και έχουν υποβληθεί περί τα 300 άρθρα.

Το 2<sup>nd</sup> Bulletin καθώς και το έντυπο εγγραφής στο συνέδριο είναι αναρτημένα στον ιστοχώρο του συνεδρίου [www.athens2011ecsmge.org](http://www.athens2011ecsmge.org).



Η Εκτελεστική Επιτροπή του ETAM είναι στην ευχάριστη θέση να ανακοινώσει την διεξαγωγή δύο Ημερίδων, σε Αθήνα (2/12/2012) και Θεσσαλονίκη (09/12/2012) αντίστοιχα, με θέμα την «Εφαρμογή του Ευρωκώδικα 8 για τον σχεδιασμό και την αποτίμηση έργων πολιτικού μηχανικού».

Σημειώνεται ότι εκτός από τις προγραμματισμένες ομιλίες, έχει ληφθεί μέριμνα να πραγματοποιηθούν τρεις (3) δεκάλεπτες τοποθετήσεις από μέλη του ETAM σε ειδικότερα θέματα τα οποία δεν περιλαμβάνονται στο κυρίως πρόγραμμα και τα οποία αναμένεται να προταθούν από τα ίδια τα ενδιαφερόμενα μέλη. Η επιλογή των προσθετων αυτών εισηγήσεων θα γίνει από την Ε.Ε. του Ε.Τ.Α.Μ. κατόπιν ηλεκτρονικής υπο-

βολής εκ μέρους των ενδιαφερομένων μιας περίληψης του περιεχομένου της εισήγησής τους. Η προθεσμία για την υποβολή της περίληψης αυτής είναι η 15/10/2011 ενώ τα ενδιαφερόμενα μέλη του ETAM παρακαλούνται να την απευθύνουν προς τον Μ. Βουγιούκα ([manolis@mail.ntua.gr](mailto:manolis@mail.ntua.gr)) ή τον Α. Σέξτο ([asextos@civil.auth.gr](mailto:asextos@civil.auth.gr)).

Τέλος, σημειώνεται ότι μετά το πέρας της Ημερίδας της 02/12/2012 στην Αθήνα, θα πραγματοποιηθεί η ετήσια Γενική Συνέλευση του Ε.Τ.Α.Μ.

Με συναδελφικούς χαιρετισμούς,

Κυριαζής Πιπιλάκης, Πρόεδρος Ε.Τ.Α.Μ.  
Αναστάσιος Σέξτος, Γραμματέας Ε.Τ.Α.Μ.

#### Π Ρ Ο Γ Ρ Α Μ Μ Α Η Μ Ε Ρ Ι Δ Α Σ

08:20-08:50 Προσέλευση. Εγγραφή.

08:50-09:00 Έναρξη ημερίδας από τον κ. **Κ. Πιπιλάκη**, πρόεδρο του Ε.Τ.Α.Μ.

#### ΕΝΟΤΗΤΑ 1: «Εφαρμογή Ευρωκώδικα 8 για τον σχεδιασμό και την αποτίμηση κτιριακών έργων - Ι»

09:00-09:15 Πορεία εφαρμογής του Ευρωκώδικα 8 – Εθνικά Προσαρτήματα.

Ομιλητής: **Μ. Φαρδής**, καθηγητής Πανεπιστημίου Πατρών

09:15-10:45 Σχεδιασμός πολυόροφου κτιρίου σύμφωνα με τον Ευρωκώδικα 8 – Μέρος 1.

Ομιλητής: **Μ. Φαρδής**, καθηγητής Πανεπιστημίου Πατρών

10:45-11:00 Διάλειμμα - καφέ.

11:00-11:30 Αποτίμηση κτιρίων σύμφωνα με τον Ευρωκώδικα 8 – Μέρος 3.

Ομιλητής: **Σ. Δρίτσος**, καθηγητής Πανεπιστημίου Πατρών

11:30-12:00 Κατασκευές από Φέρουσα Τοιχοποιία σύμφωνα με τους Ευρωκώδικες 6 και 8.

Ομιλητές: **Ε. Βιντζηλαίου**, καθηγήτρια Ε.Μ.Π. (Ημερίδα Αθήνας)

**Κ. Στυλιανίδης**, καθηγητής Α.Π.Θ. (Ημερίδα Θεσσαλονίκης)

12:00-12:20 Αντισεισμικός σχεδιασμός ξύλινων κατασκευών σύμφωνα με τους Ευρωκώδικες 5 και 8.

Ομιλητής: **Ε. Κατσαραγάκης**, επίκ. καθηγητής Ε.Μ.Π.

12:20-12:50 Αντισεισμικός σχεδιασμός μεταλλικών κατασκευών σύμφωνα με τους Ευρωκώδικες 3 και 8.

Ομιλητής: **Ι. Βάγιας**, καθηγητής Ε.Μ.Π. (Ημερίδα Αθήνας)

**Χ. Μπανιωτόπουλος**, καθηγητής Α.Π.Θ. (Ημερίδα Θεσσαλονίκης)

#### ΕΝΟΤΗΤΑ 2: «Εφαρμογή Ευρωκώδικα 8 – Μέρος 5 για τον σχεδιασμό γεωτεχνικών έργων»

12:50-13:20 Φορτία σχεδιασμού. Παρούσα κατάσταση και ανάγκες βελτίωσης.

Ομιλητής: **Κ.Πιπιλάκης**, καθηγητής Α.Π.Θ.

13:20-13:50 Γεωτεχνικά θέματα στον EC8. Ανάγκες βελτίωσης.

Ομιλητής: **Γ.Γκαζέτας**, καθηγητής Ε.Μ.Π.

13:50-14:30 Διάλειμμα

#### ΕΝΟΤΗΤΑ 3: «Εφαρμογή Ευρωκώδικα 8 – Μέρος 2 για τον σχεδιασμό γεφυρών»

14:30-15:00 Ευρωκώδικας 8-2: Απαιτήσεις σχεδιασμού – Σεισμικές Δράσεις – Ανάλυση.

Ομιλητής: **Α. Κάππος**, καθηγητής Α.Π.Θ. (Ημερίδα Θεσσαλονίκης)

**Α. Σέξτος**, επίκ. καθηγητής Α.Π.Θ. (Ημερίδα Αθήνας)

15:00-15:30 Ευρωκώδικας 8-2: Έλεγχοι – Κατασκευαστική διαμόρφωση – Σεισμική Μόνωση.

Ομιλητής: **Β. Κόλιας**, Δρ. Πολιτικός Μηχανικός

#### ΕΝΟΤΗΤΑ 4: «Ευρωκώδικας 8 και ειδικότερα θέματα εφαρμογής»

15:30-16:00 Παραδείγματα εφαρμογής - σύγκριση με τον ΕΑΚ2000: αριθμητικά παραδείγματα.

Ομιλητής: **Γ. Βαδαλούκας**, Δρ. Πολιτικός Μηχανικός

16:00-17:00 Ανοιχτό Βήμα προς τα μέλη του ETAM και συζήτηση στρογγυλής τραπέζης.

(Συντονιστής **Μ. Βουγιούκας**, Λέκτορας Ε.Μ.Π.)

- Θα πραγματοποιηθούν τρεις (3) δεκάλεπτες τοποθετήσεις μελών του ETAM.

- Η επιλογή των ομιλιών θα πραγματοποιηθεί από την Ε.Ε. του Ε.Τ.Α.Μ. κατόπιν ανοιχτής πρόσκλησης δια του διαδικτύου προς τα μέλη και ηλεκτρονικής υποβολής εκ μέρους των ενδιαφερομένων του περιεχομένου της εισήγησής τους.

- Προθεσμία υποβολής προσχεδίου εισηγήσεων: 15/10/2011.

- Αποστολή προσχεδίου εισηγήσεων προς: Μ. Βουγιούκα ([manolis@mail.ntua.gr](mailto:manolis@mail.ntua.gr)) ή Α. Σέξτο ([asextos@civil.auth.gr](mailto:asextos@civil.auth.gr))

17:00 Λήξη.

17:30-19:00 **Γενική Συνέλευση ETAM (Ημερίδα Αθήνας)**



#### Ταρακούνημα στα θεμέλια της Γεωτεχνικής Εκπαίδευσης!

#### SHAKING THE FOUNDATIONS of Geo-Engineering Education

**Πότε;** Από 4 έως 6 Ιουλίου 2012

**Πού;** Στη μαγευτική δυτική ακτή της Ιρλανδίας (National University of Ireland, Galway)

**Μα, για τι πρόκειται;** Συνέδριο που διοργανώνεται από την Επιτροπή της ISSMGE για την Εκπαίδευση (TC 306)

**Πώς μπορεί ο καθένας να συμβάλει στο ταρακούνημα;** Με την υποβολή άρθρου (η προθεσμία υποβολής περιλήψεων είναι 31 Αυγούστου 2011) και με την ενεργό συμμετοχή

στο συνέδριο, που περιλαμβάνει συνεδρίες-workshop σχεδιασμένες ειδικά για τη δομημένη κατάθεση απόψεων και εμπειριών και την εξαγωγή συμπερασμάτων.

**Τι θα χάσουν όσοι δεν έρθουν;** Προσκεκλημένες ομιλίες από κορυφαίους εκπροσώπους της Γεωτεχνικής Μηχανικής (John Atkinson, John Burland, Paul Mayne, Brian Simpson) και της Εκπαίδευσης του Μηχανικού ([Rich Felder](#), [Steve Ressler](#)). Ακόμα, τη δυνατότητα να επιλεγεί το άρθρο τους για προσκεκλημένη ομιλία (επιπλέον των παραπάνω) και/ή για δημοσίευση του αναμορφωμένου άρθρου σε επιστημονικό περιοδικό. Πάνω από όλα, όμως, δεν θα έχουν την ευκαιρία να λένε μετά «ήμουν κι εγώ εκεί...».

**Περισσότερες πληροφορίες;** [www.sfge2012.com](http://www.sfge2012.com), [mpanta@central.ntua.gr](mailto:mpanta@central.ntua.gr)



## Piraeus, the ancient island of Athens: Evidence from Holocene sediments and historical archives

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### ABSTRACT

The famous Greek geographer Strabo wrote in the first century A.D., that Piraeus was formerly an island and lay 'over against' the mainland, from which it got its name. To validate Strabo's hypothesis, cartographic and historical data were compiled with multiproxy paleoenvironmental analyses and radiocarbon dating from a series of boreholes drilled in the Cephissus coastal plain, southwest of Athens, Greece. The results of this interdisciplinary geoarchaeological research demonstrate the reliability of Strabo's text by revealing that Piraeus was indeed an island. In early Holocene time, the rocky hill of Piraeus was linked to the mainland of Attica. During the late to final Neolithic Period (4850–3450 B.C.), Piraeus became an island in a shallow marine bay, due to sea-level rise in the Holocene. Between 2850 and 1550 B.C., in the Early and Middle Bronze Age, Piraeus was separated from the mainland by a wide lagoon. In the fifth century B.C., Themistocles, Cimon, and then Pericles connected Athens to Piraeus by building two "long walls" partly built on a residual coastal marsh called the

Halipedon. This study reveals an impressive example of past landscape evolution.

### INTRODUCTION

In the first century A.D., the Greek geographer Strabo wrote, "Piraeus was formerly an island and lay 'over against' [beyond, on the other side] the mainland, from which it got the name it has" (*in* Jones, 1960, p. 216–219, our brackets; Chamfrain, 2009). Many centuries before Strabo visited Attica, the idea of Piraeus as an island to the southwest of Athens was present in the oral tradition of the Athenians. We know that the rocky island of Piraeus was connected to the mainland during the fifth century B.C. (Strabo, *in* Jones, 1960, p. 216–219; Plutarch's Lives of Cimon, *in* Perrin, 1985, p. 444–447; Conwell, 2008; Garland, 1987). First Themistocles (Plutarch's Lives of Themistocles, *in* Perrin, 1985, p. 54–55), then Cimon and Pericles (for the later middle wall) built two "long walls" connecting the city of Athens with the harbors of Phaleron Bay and Piraeus. The objective was to fortify all the territory between Athens and its main harbour Piraeus, creating a fortress with access to the sea (Steinhauer, 2000; Papahatzis, 1974). However, the question remains, was Piraeus already connected to the plain of the Cephissus River during the construction of the long walls, or was it necessary to fill in the marine or lagoon areas in between?

In order to obtain answers, it was essential to understand the natural and cultural processes that affected the sedimentary sequences deposited between the hill of Piraeus and the plain of Cephissus (Fig. 1). The main factors that feature in the evolution of the Piraeus coastal landscape are the Holocene sea-level rise, which was a reaction to glacio-hydroisostatic changes (Blackman, 1973; Kelletat, 2005; Lambeck et al., 2004; Lambeck, 1995, 1996; Lambeck and Bard, 2000; Lambeck and Purcell, 2005; Loven et al., 2007; Peltier, 2004), the tectonic stability of the area documented by the relative absence of earthquakes during the past few thousand years (Pirazzoli, 2005; Flemming et al., 1973; Flemming and Webb, 1986; Papazachos, 1990; Stocchi and Spada, 2009; Lekkas, 2001), the low tidal range ( $\pm 0.25$ – $0.30$  m) (Andritsanos et al., 2000), and the progradation of the deltaic fan of the Cephissus River.

We drilled and sampled in detail 10 rotational boreholes (see the GSA Data Repository<sup>1</sup>). The core samples were analyzed for microfaunal content and radiocarbon dating. Topographic and bathymetric data from recent and old maps (Curtius and Kaupert, 1881) and references in ancient authors (Strabo, *in* Jones, 1960, p. 216–219; Plutarch's Lives of Cimon, *in* Perrin, 1985, p. 444–447) were combined with the results of the detailed analysis of core samples.

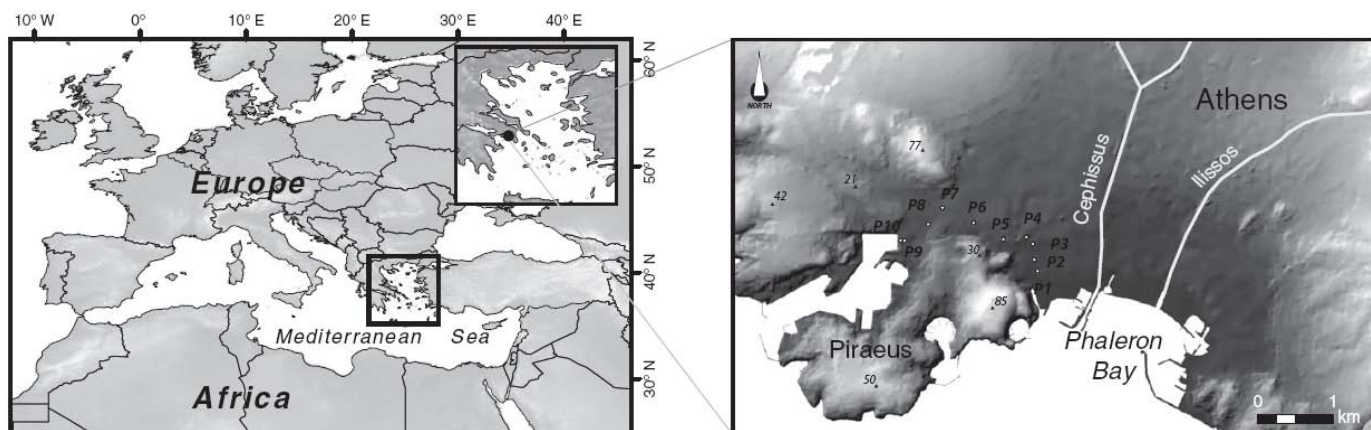
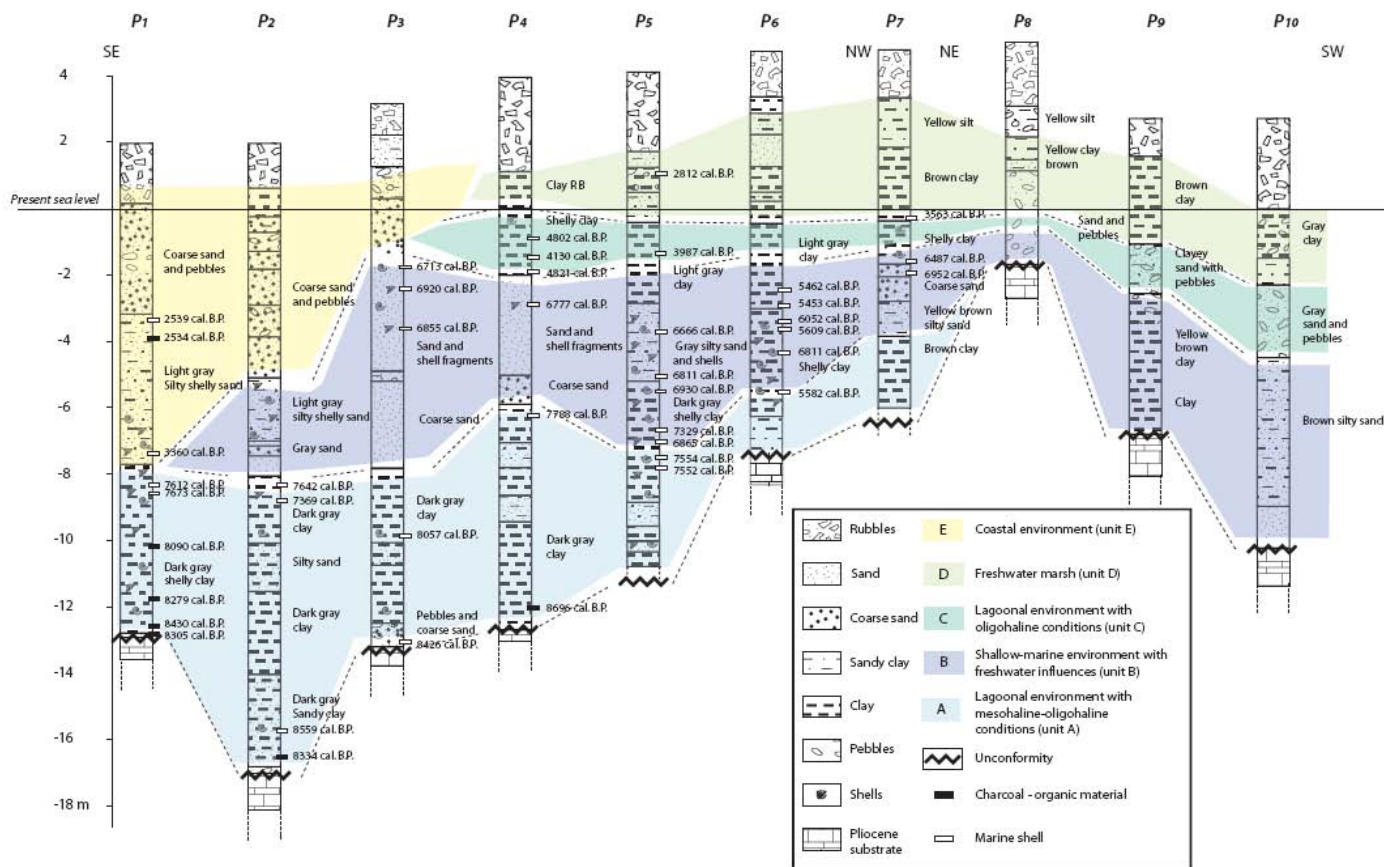


Figure 1. Location map.



**Figure 2.** Lithostratigraphical transect with direction of southeast to northwest, and then northeast to southwest, and descriptions of 10 boreholes. Five main lithostratigraphical units (from oldest to youngest, A – E) were defined. Unit A consists of gray to dark gray clay with silty sand layers and is dated at between ca. 8700 and 7500 cal. yr B.P. (Late Mesolithic to Middle Neolithic Period, 6750–5550 B.C.); it represents a mesohaline-oligohaline lagoonal environment with freshwater inputs. Unit B consists of shelly silty sand to sand, grayish in eastern part and grayish to yellowish-brown in western part. It is dated at between ca. 6800 and 5400 cal. yr B.P. (Late Neolithic to Final Neolithic Period, 4850–3450 B.C.), and represents shallow-marine environment. Unit C consists of light gray to gray clay with sand and pebble layers in the western part, and is dated at between ca. 4800 and 3500 yr cal. B.P. (Early to Middle Bronze Age, 2850–1550 B.C.); it represents oligohaline lagoonal environment with freshwater inputs. Unit D consists of brown to yellowish-brown clay and silt. It is younger than 2800 cal. yr B.P. (including the Classical Period of the fifth century B.C.), and represents marshy environment that corresponds to deposits of Cephissus River, which overflowed its banks and classical archaeological strata. Unit E consists of light gray, medium to coarse sand. It ranges between 3400 and 2500 cal. yr B.P. and represents high-energy coastal environment. Rubbles in lithostratigraphy of top of cross section correspond to human deposits of past centuries.

## RESULTS AND DISCUSSION

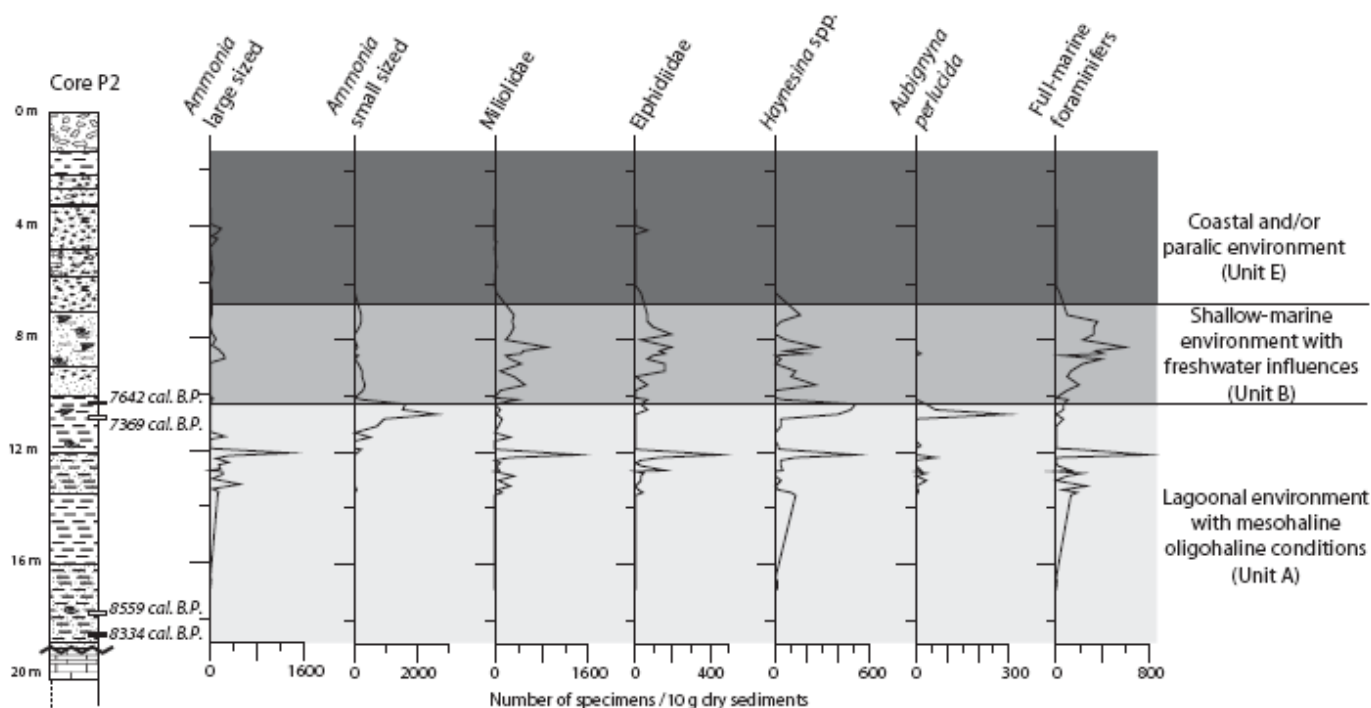
The grouping of sedimentary facies determined in the boreholes provided five well-distinguished lithostratigraphical units (units A–E in Fig. 2). The lowermost unit A consists of gray to dark gray clay with silty sand layers. Based on the available radiocarbon dating, the unit was determined to have been deposited between ca. 8700 and 7500 cal. (calendar) yr B.P. and is present in boreholes P1 to P8. The microfauna record presents fluctuations between marine foraminiferal species (mainly represented by *Miliolidae*, and to a lesser degree by *Discorbis* spp., *D. pattelliformis*, *Asterigerinata*, *Neoconorbina*, *Gyroidinoides*, *Nonion*, *Globulimina*, *Hanzawaia*, *Valvulineria*, *Globulina*, *Stainforthia*, *Nonionella*, *Bolivina* spp., *Bulimina* spp., *Rosalina* spp.) and euryhaline species (mainly represented by *Ammonia* spp., large- and small-sized, *Elphidium* spp., *Haynesina* spp., *Aubignyna perlucida*) (Figs. 3 and 4) that indicate an alternating mesohaline-oligohaline lagoonal environment (Bronnimann et al., 1992; Loeblich and Tappan, 1994). At that time, Piraeus was connected with the mainland by a narrow isthmus, and a long sandy beach ridge developed in the southern part of the lagoon (Fig. 5A). Unit A has not been recorded in the western part of

the coastal plain (boreholes P8, P9, P10; Fig. 2), reinforcing the above-mentioned hypothesis.

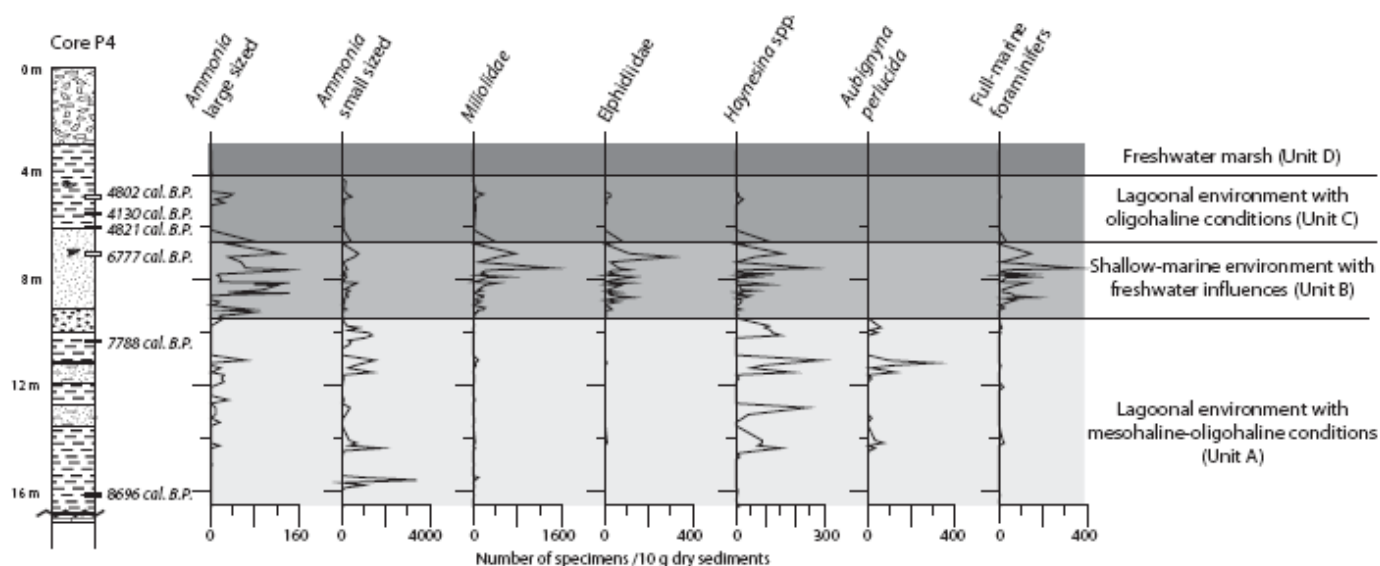
Unit B, dated at between 6800 and 5400 cal. yr B.P., consists of gray to yellowish-brown shelly silty sand and was recorded within all boreholes. The microfauna consists mainly of marine foraminiferal species (Figs. 3 and 4). However, euryhaline species such as *Haynesina* spp., *Ammonia*, and *Elphidiidae* are present, suggesting a shallow-marine paleoenvironment that also exhibits lagoonal features. In this period, Piraeus was an island in the center of a wide, shallow marine bay (Fig. 5B).

Unit C, determined in boreholes P4–P10, is distinguished by light gray to gray clay with sand and pebbles. It is dated to between ca. 4800–3500 cal. yr B.P. The microfaunal content reveals the minor presence of *Ammonia* and *Haynesina* spp. (Fig. 4), suggesting an oligohaline paleoenvironment. In this period, a wide lagoon became established that was separated from the sea by beach barriers (Fig. 5C).

Unit D, younger than 2800 cal. yr B.P., consists of brown to yellowish-brown clay and silt. This unit is absent in the eastern part of the Cephissus plain (boreholes P1–P3, Fig. 1). The microfauna is characterized by the minor presence



**Figure 3.** Foraminiferal relative abundances in borehole P<sub>2</sub>.



**Figure 4.** Foraminiferal relative abundances in borehole P<sub>4</sub>.

of *Ammonia* and *Haynesina* spp. (Fig. 4), and indicates a marshy oligohaline paleoenvironment.

Both units C and D transition laterally to unit E, toward the eastern part of the Cephissus plain. Unit E consists of light gray, medium to coarse sand, representing a high-energy coastal environment. It spans the centuries between 3400 and 2500 cal. yr B.P. and contains rare, mostly broken, marine foraminiferal specimens (Fig. 3), which are considered to have been mainly transported; we therefore interpret this unit as representing a paralic environment.

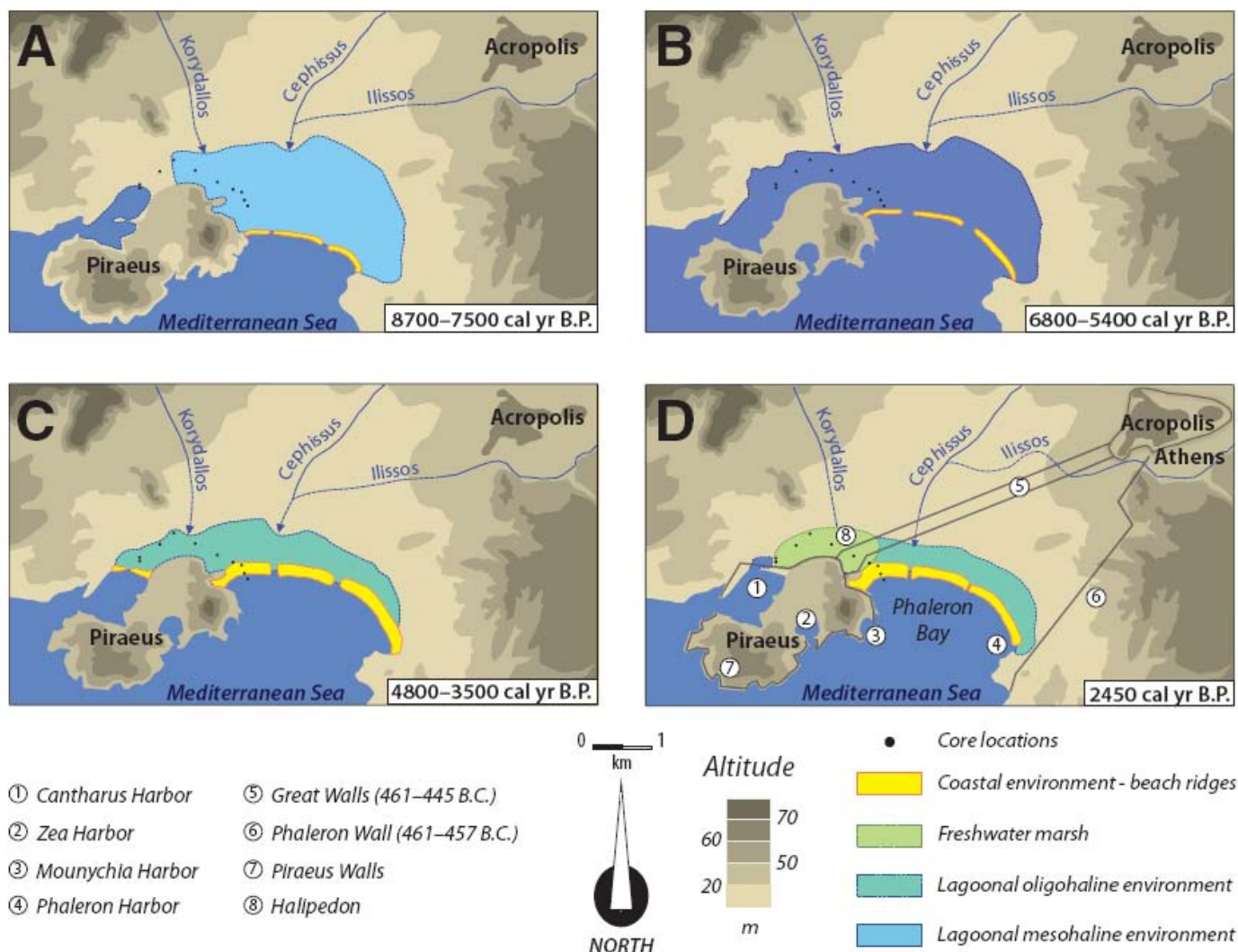
Our paleoenvironmental interpretation suggests that between 6800 and 5400 cal. yr B.P., Piraeus was an island in the center of a shallow marine bay (Fig. 5B). Until ca. 3500 cal. yr B.P., a wide oligohaline lagoon separated the island of Piraeus from the mainland (Fig. 5C). This lagoon was filled in periodically by the deltaic fans of the Cephissus and

Korydallos Rivers. It is difficult to say exactly when Piraeus became connected to the mainland, but it was certainly after 3000 cal. yr B.P. and before the sixth century B.C.; during the fifth century B.C., when the long walls were constructed, Piraeus was connected to the mainland. A freshwater marsh remained at the northern part of the long walls (Halipedon), while beach ridges developed in the eastern part of the Piraeus peninsula (Fig. 5D). The marshlands north of the beach ridges would have become filled with coarse material during the construction of the long walls, as is mentioned in Plutarch's text (see Perrin, 1985, p. 444–447).

## CONCLUSIONS

The geoarchaeological research has proven Strabo's statement, that Piraeus was formerly an island, to be true. However, it is interesting to note that this was only factually





**Figure 5.** Four maps showing paleogeographical evolution of Piraeus during Holocene. A: Late Mesolithic to Middle Neolithic Period, between 8700 and 7500 cal. yr B.P. (6750–5550 B.C.). B: Late Neolithic to Final Neolithic Period, between 6800 and 5400 cal. Yr B.P. (4850–3450 B.C.). C: Early to Middle Bronze Age, between 4800 and 3500 cal. yr B.P. (2850–1550 B.C.). D: Classical period of fifth century B.C., 2500 cal. yr B.P.

accurate many millennia (ca. 7000–5000 cal. yr B.P.) before Strabo ever visited this region. Two main hypotheses could be proposed to explain Strabo's accuracy in this matter. The first is based on oral tradition (Thomas, 1989) that perpetuated the collective memory of the island of Piraeus for several millennia. Strabo pieced together the oral history with "Piraeus" etymology, i.e., "peran" meaning "beyond" or "on the other side" (Chantraine, 2009).

The second hypothesis implies that the landscape was so flat around the former island, even during the first century A.D., that, as a geographer, Strabo deduced that Piraeus had been an island. It was impossible for him to date the connection between the mainland and the former island, but he could see the remnants of a former marsh and knew that the long walls had been built during the fifth century B.C. In this case, Strabo did not rely on the ancient stories about the sea surrounding the island, but rather on his own understanding and experience of past marine conditions deduced from the landscape (Morton, 2001).

There could also be a synthesis of these two hypotheses (Aujac, 1966), illustrating the two sides of Strabo's knowledge: he was both a good reader of the landscape, as well as being a good listener to the histories of the location, using the oral accounts to supplement his deductions.

## ACKNOWLEDGMENTS

We gratefully acknowledge funding of the research project by the Centre National de la Recherche Scientifique (CNRS). We thank CNRS Institut des Sciences Humaines et Sociales (SHS) Director F. Favory; "ARTEMIS-SHS" for radiocarbon funding; the Ecole Française d'Athènes for logistic help during the field trip; Sylvie Muller, Olivier Aurenche, and Bruno Helly for useful comments on the text; and Julien Cavero for figure preparation. We also thank three anonymous referees for helpful remarks, and we thank Christine Oberlin for  $^{14}\text{C}$  discussions. We also thank Stephanie Holm for polishing the English.

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<sup>1</sup>GSA Data Repository item 2011172, materials, methods, and Table DR1 (radiocarbon results), is available online at [www.geosociety.org/pubs/ft2011.htm](http://www.geosociety.org/pubs/ft2011.htm), or on request from [editing@geosociety.org](mailto:editing@geosociety.org) or Documents Secretary, GSA, P.O. Box 9140, Boulder, CO 80301, USA.

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## **Τελικά ο Στράβωνας είχε δίκιο για το αρχαίο νησί του Πειραιά**



Ο Πειραιάς φαίνεται ότι ξανασυνδέθηκε με την Αθήνα λόγω των αποθέσεων του Κηφισού

Τον πρώτο αιώνα προ Χριστού, ο Στράβων διατύπωσε την υποψία ότι ο Πειραιάς ήταν κάποτε νησί, πριν συνδεθεί τελικά με την υπόλοιπη Αττική. Φαίνεται ότι ο αρχαίος ιστορικός και γεωγράφος είχε δίκιο, όπως επιβεβαιώνουν τώρα Έλληνες και Γάλλοι γεωλόγοι και αρχαιολόγοι.

Η ερευνητική ομάδα συνέλεξε πυρήνες από ερευνητικές γεωτρήσεις κοντά στον Πειραιά και τον Κηφισό και χρησιμοποίησε ραδιοχρονολόγηση άνθρακα για να δημιουργήσει το γεωλογικό χρονικό της περιοχής.

«Τα αποτελέσματα αυτής της διατομεακής έρευνας γεωαρχαιολογίας καταδεικνύει την αξιοπιστία των κειμένων του Στράβωνα αποκαλύπτοντας ότι ο Πειραιάς ήταν όντως νησί» γράφουν οι ερευνητές στην έγκριτη επιθεώρηση *Geology*.

Πριν από 8.000 χρόνια, στην αρχή της Ολόκαινου εποχής, ο Πειραιάς ήταν λόφος συνδεδεμένος με την ηπειρωτική Αττική μέσω μιας γέφυρας ξηράς -μια γεωγραφική διάταξη παρόμοια με τη σημερινή.

Οι αναλύσεις στα δείγματα υπεδάφους δείχνουν ότι η αλλαγή ριζικά στα τέλη της Νεολιθικής εποχής, το διάστημα 4850-3450 π.Χ. Εκείνη την εποχή η στάθμη της Μεσογείου συνέχιζε να ανεβαίνει, μετά τη λήξη της τελευταίας παγετώδους περιόδου.

Ο Πειραιάς έγινε έτσι νησί που διαχωριζόταν από την Αθήνα από έναν ρηχό κόλπο.

Τη γεωλογία της περιοχής άλλαξαν ξανά τα ποτάμια του Κηφισού και του Κορυδαλλού, των οποίων οι αποθέσεις σχημάτισαν μια λιμνοθάλασσα ανάμεσα στον Πειραιά και την Αθήνα πριν από περίπου 4.000 χρόνια.

Τα ιζήματα των ποταμών συνέχισαν να γεμίζουν τη λιμνοθάλασσα μέχρι τον πέμπτο αιώνα π.Χ, όταν «ο Θεμιστοκλής, ο Κίμων και αργότερα ο Περικλής συνέδεσαν την Αθήνα με τον Πειραιά κατασκευάζοντας δύο "μακρά τείχη", χτισμένα εν μέρει πάνω σε έναν παράκτιο τέλμα που ονομαζόταν Αλίπεδο» αναφέρουν οι ερευνητές.

Τα ευρήματα υποδεικνύουν πάντως ότι το μεγάλο κατασκευαστικό έργο δεν ευθύνεται για την ακόλουθη εξαφάνιση του βάλτου.

Πώς όμως μπόρεσε ο Στράβωνας να μαντέψει το γεωλογικό παρελθόν της παράκτιας πόλης. Οι ερευνητές εκτιμούν ότι ο αρχαίος Πόντιος ιστορικός είτε ήταν πολύ καλός αυτοδίδακτος γεωλόγος, είτε βασίστηκε στην αθηναϊκή προφορική

παράδοση, η οποία είχε διατηρήσει με ακρίβεια το γεωλογικό χρονικό της περιοχής.

Η άποψη ότι ο Πειραιάς ήταν κάποτε νησί εμφανίζεται εξάλλου και στο λεξικό του Σουίδα (ή Σούδα) που χρονολογείται στον 10ο αιώνα.

Τη μελέτη στο *Geology* υπογράφει ο Κοσμάς Παυλόπουλος του Χαροκόπειου Πανεπιστημίου, η Μαρία Τριανταφύλλου της Σχολής Γεωλογίας του Πανεπιστημίου Αθηνών και οι συνεργάτες τους από το γαλλικό Εθνικό Κέντρο Επιστημονικής Έρευνας (CNRS) και το Πανεπιστήμιο Παρισιού 1.

Newsroom ΔΟΛ

# ΚΑΤΑΤΑΞΕΙΣ ΠΑΝΕΠΙΣΤΗΜΙΩΝ

αποτύπωση της ερευνητικής παραγωγής κάθε χώρας ανά επιστημονική περιοχή αλλά και επί μέρους τομείς. Ανέτρεξα στην ιστοσελίδα αυτή και για το γνωστικό αντικείμενο Civil and Structural Engineering πήρα τον Πίνακα 1 για τις πρώτες 50 χώρες.

Όπως βλέπετε, η Ελλάδα κατατάσσεται στην 18<sup>η</sup> θέση παγκοσμίως. Τούτο έρχεται να επιβεβαιώσει το σχετικό άρθρο στο προηγούμενο τεύχος του περιοδικού μας.











Αυτή τη φορά, όμως έκανα μια ακόμα άσκηση: Έκανα αναγωγή των στοιχείων του Πίνακα 1 στον πληθυσμό κάθε χώρας (όπως προκύπτει από την Wikipedia) και προέκυψε ο Πίνακας 2.

Αγαπητά μέλη,

Προσφάτως έλαβα ένα ηλ.μη. από καθηγητή του Πανεπιστημίου Αθηνών που μου συνιστούσε την πολύ ενδιαφέρουσα ιστοσελίδα <http://www.scimagojr.com>, που επιτρέπει την










































**ΠΙΝΑΚΑΣ 1**

	Country	Documents	Citable documents	Citations	Self-Citations	Citations per Document	H index
1	 <a href="#">United States</a>	22.365	21.893	141.697	53.035	6,26	94
2	 <a href="#">China</a>	14.442	14.370	24.952	15.639	4,33	40
3	 <a href="#">United Kingdom</a>	6.647	6.426	34.065	9.629	5,80	47
4	 <a href="#">Canada</a>	5.441	5.298	29.769	9.124	6,07	47
5	 <a href="#">Japan</a>	3.308	3.250	17.251	3.917	5,91	42
6	 <a href="#">Australia</a>	2.915	2.801	18.176	4.461	7,24	45
7	 <a href="#">South Korea</a>	2.628	2.596	11.293	2.653	5,85	31
8	 <a href="#">India</a>	2.381	2.256	12.183	3.640	6,03	38
9	 <a href="#">Italy</a>	2.258	2.199	11.824	3.661	7,38	39
10	 <a href="#">Germany</a>	2.080	2.055	10.052	1.834	5,14	37
11	 <a href="#">Taiwan</a>	2.063	2.042	11.838	3.301	7,10	34
12	 <a href="#">Hong Kong</a>	1.987	1.958	15.808	4.193	9,45	44
13	 <a href="#">France</a>	1.705	1.683	9.755	2.409	6,66	34
14	 <a href="#">Turkey</a>	1.700	1.638	7.247	3.030	5,93	27
15	 <a href="#">Netherlands</a>	1.442	1.416	7.507	1.789	6,21	35
16	 <a href="#">Spain</a>	1.268	1.230	5.042	1.702	6,36	25
17	 <a href="#">Singapore</a>	1.211	1.188	8.749	1.609	7,85	35
18	 <a href="#">Greece</a>	980	954	5.727	1.317	7,47	25
19	 <a href="#">Iran</a>	903	875	3.147	1.092	6,16	19
20	 <a href="#">Sweden</a>	829	811	5.345	928	7,35	29
21	 <a href="#">Switzerland</a>	796	744	4.376	918	6,96	29
22	 <a href="#">Poland</a>	775	764	1.833	631	2,87	17
23	 <a href="#">Portugal</a>	754	735	4.163	1.241	7,77	26
24	 <a href="#">Israel</a>	685	675	4.626	1.042	7,03	27
25	 <a href="#">Brazil</a>	659	646	2.290	449	5,08	19
26	 <a href="#">New Zealand</a>	643	625	3.423	892	6,20	24
27	 <a href="#">Mexico</a>	546	541	1.324	286	3,26	18
28	 <a href="#">Belgium</a>	537	532	3.165	630	7,87	24
29	 <a href="#">Denmark</a>	507	496	4.098	685	8,98	25
30	 <a href="#">Egypt</a>	497	487	3.059	301	7,06	21
31	 <a href="#">Norway</a>	453	448	2.263	505	5,75	22
32	 <a href="#">South Africa</a>	453	437	1.517	276	3,48	15
33	 <a href="#">Thailand</a>	383	374	1.816	290	6,59	18
34	 <a href="#">Finland</a>	359	355	1.063	176	3,19	15
35	 <a href="#">Austria</a>	309	304	984	200	4,98	14
36	 <a href="#">Czech Republic</a>	261	259	627	124	5,48	10
37	 <a href="#">Saudi Arabia</a>	239	239	1.616	150	6,76	18
38	 <a href="#">Malaysia</a>	234	230	668	132	4,26	12
39	 <a href="#">Jordan</a>	229	229	783	118	3,74	13
40	 <a href="#">Russian</a>	225	224	1.001	129	4,87	15










		<a href="#">Federation</a>						
41		<a href="#">Ireland</a>	213	212	776	144	3,75	13
42		<a href="#">Chile</a>	207	202	790	167	5,56	14
43		<a href="#">Argentina</a>	196	195	751	152	4,49	14
44		<a href="#">United Arab Emirates</a>	185	182	630	108	4,33	12
45		<a href="#">Croatia</a>	166	165	164	70	2,98	6
46		<a href="#">Hungary</a>	151	149	360	105	4,82	11
47		<a href="#">Lebanon</a>	147	144	712	148	5,55	12
48		<a href="#">Slovenia</a>	145	143	524	176	5,42	10
49		<a href="#">Venezuela</a>	139	139	445	64	2,95	11
50		<a href="#">Algeria</a>	123	121	438	162	4,57	10

H index : Country's number of articles (h) that have received at least h citations

## ΠΙΝΑΚΑΣ 2

	Χώρα	Πληθυσμός P	D / P	Κατάταξη	Citations / P	Κατάταξη	Citations μείον Self- Citations / P	Κατάταξη
1	 <a href="#">United States</a>	311,341,000	71.83	14	455.12	13	284.77	14
2	 <a href="#">China</a>	1,339,724,852	10.78	37	18.62	44	6.95	49
3	 <a href="#">United Kingdom</a>	62,008,048	107.20	6	549.36	9	394.08	9
4	 <a href="#">Canada</a>	34,449,000	157.94	3	864.15	3	599.29	5
5	 <a href="#">Japan</a>	127,960,000	25.85	28	134.82	24	104.20	25
6	 <a href="#">Australia</a>	22,607,272	128.94	5	803.99	4	606.66	4
7	 <a href="#">South Korea</a>	48,988,833	53.64	18	230.52	18	176.37	17
8	 <a href="#">India</a>	1,210,193,422	1.97	49	10.07	49	7.06	48
9	 <a href="#">Italy</a>	60,605,053	37.26	22	195.10	20	134.69	21
10	 <a href="#">Germany</a>	81,802,000	25.43	29	122.88	26	100.46	26
11	 <a href="#">Taiwan</a>	23,165,878	89.05	9	511.01	10	368.52	11
12	 <a href="#">Hong Kong</a>	7,061,200	281.40	1	2238.71	1	1644.90	1
13	 <a href="#">France</a>	65,821,885	25.90	27	148.20	23	111.60	23
14	 <a href="#">Turkey</a>	73,722,988	23.06	31	98.30	29	57.20	30
15	 <a href="#">Netherlands</a>	16,668,100	86.51	13	450.38	14	343.05	13
16	 <a href="#">Spain</a>	46,148,605	27.48	26	109.26	28	72.37	28
17	 <a href="#">Singapore</a>	5,076,700	238.54	2	1723.36	2	1406.43	2
18	 <a href="#">Greece</a>	11,306,183	86.68	12	506.54	11	390.05	10
19	 <a href="#">Iran</a>	75,289,000	11.99	36	41.80	36	27.29	37
20	 <a href="#">Sweden</a>	9,422,661	87.98	11	567.25	8	468.76	7
21	 <a href="#">Switzerland</a>	78,665,000	10.12	38	55.63	33	43.96	33
22	 <a href="#">Poland</a>	38,092,000	20.35	33	48.12	34	31.56	36
23	 <a href="#">Portugal</a>	10,636,888	70.89	15	391.37	15	274.70	15
24	 <a href="#">Israel</a>	7,746,400	88.43	10	597.18	7	462.67	8
25	 <a href="#">Brazil</a>	190,732,694	3.46	47	12.01	47	9.65	45
26	 <a href="#">New Zealand</a>	4,411,300	145.76	4	775.96	5	573.75	6
27	 <a href="#">Mexico</a>	112,336,538	4.86	45	11.79	48	9.24	46
28	 <a href="#">Belgium</a>	10,827,519	49.60	19	292.31	16	234.13	16
29	 <a href="#">Denmark</a>	5,560,628	91.18	8	736.97	6	613.78	3
30	 <a href="#">Egypt</a>	80,221,000	6.20	42	38.13	37	34.38	35
31	 <a href="#">Norway</a>	4,938,100	91.74	7	458.27	12	356.01	12
32	 <a href="#">South Africa</a>	49,991,300	9.06	39	30.35	40	24.82	39
33	 <a href="#">Thailand</a>	67,041,000	5.71	43	27.09	41	22.76	40
34	 <a href="#">Finland</a>	5,383,510	66.69	17	197.45	19	164.76	19
35	 <a href="#">Austria</a>	8,396,760	36.80	24	117.19	27	93.37	27
36	 <a href="#">Czech Republic</a>	10,515,818	24.82	30	59.62	31	47.83	32
37	 <a href="#">Saudi Arabia</a>	27,136,977	8.81	40	59.55	32	54.02	31
38	 <a href="#">Malaysia</a>	27,565,821	8.49	41	24.23	42	19.44	42
39	 <a href="#">Jordan</a>	6,187,000	37.01	23	126.56	25	107.48	24
40	 <a href="#">Russian Federation</a>	142,905,200	1.57	50	7.00	50	6.10	50
41	 <a href="#">Ireland</a>	4,470,700	47.64	20	173.57	21	141.36	20



42		Chile	17,228,000	12.02	35	45.86	35	36.16	34
43		Argentina	40,091,359	4.89	44	18.73	43	14.94	43
44		United Arab Emirates	8,264,070	22.39	32	76.23	30	63.17	29
45		Croatia	4,425,747	37.51	21	37.06	38	21.24	41
46		Hungary	10,014,324	15.08	34	35.95	39	25.46	38
47		Lebanon	4,228,000	34.77	25	168.40	22	133.40	22
48		Slovenia	2,046,490	70.85	16	256.05	17	170.05	18
49		Venezuela	29,215,000	4.76	46	15.23	45	13.04	44
50		Algeria	36,300,000	3.39	48	12.07	46	7.60	47

8	Κατάταξη στην πρώτη δεκάδα
10	Κατάταξη Ελλάδας

Από τον Πίνακα 2 προκύπτει ότι η αναγωγή στον πληθυσμό κάθε χώρας των δημοσιεύσεων κ.λπ. ανατρέπει άρδην την παγκόσμια κατάσταση, αναδεικνύοντας στις πρώτες δύο εκ των δέκα πρώτων θέσεων τις πολύ μικρές χώρες της Άπω Ανατολής (Hong Kong και Singapore) σε όλες τις κατηγορίες, ακολουθούμενες από Canada, Australia και New Zealand, Denmark, Israel, United Kingdom, Sweden, Taiwan και Norway, ενώ η Ελλάδα κατατάσσεται σύμφωνα με την παράμετρο «Citations μείον Self-Citations» / Πληθυσμό στην 10<sup>η</sup> θέση!



## 20 Most Useful College Majors

**With college graduation ceremonies just weeks away, The Daily Beast tallies the statistics to figure out which majors—from engineering to mathematics—are most valuable.**

As the 1.5 million members of the class of 2012 prepare for internships and ready their résumés, those with engineering or business degrees will likely enjoy an easier transition into the world of employment than those holding journalism or fine arts degrees. And those engineers and entrepreneurs have company.

To find which degrees are the most valuable in the long run, The Daily Beast considered which degrees offer the most job opportunities as well as relatively high pay. Weighted equally, we ranked each degree's statistics compared to the average for each category. Data are from the U.S. Bureau of Labor Statistics and Payscale:

- Starting and mid-career salary levels, using the profession most associated with the degree.
- The expected change in the total number of jobs from 2008-2018.
- The expected percentage change in available jobs from 2008-2018. The following gallery also provides the number of degrees awarded during the 2008-2009 academic year according to the National Center for Education Statistics.

So, what degree will be most valuable in the years to come?

1. Biomedical Engineering
2. Business
3. Education
4. Software Engineering
5. Petroleum Engineering
6. Multimedia & Web Design
7. Nursing
8. Finance
9. Biochemistry
10. Management Information Systems
11. Environmental Engineering
12. Civil Engineering
13. Accounting
14. Computer Science
15. Applied Mathematics
16. Building Construction
17. Athletic Training
18. Mathematics
19. Industrial Engineering
20. Environmental Science

For inquiries, please contact The Daily Beast at [editorial@thedailybeast.com](mailto:editorial@thedailybeast.com).

(The Daily Beast, 10<sup>th</sup> May 2011)

Όχι άσχημα για τους πολιτικούς μηχανικούς....

# ΠΡΟΣΦΟΡΑ ΕΡΓΑΣΙΑΣ ΣΕ ΓΕΩΤΕΧΝΙΚΟΥΣ ΕΠΙΣΤΗΜΟΝΕΣ

## **Geotechnical Engineers / Engineering Geologists**

For international multi-disciplinary consultancy 2-3 Geotechnical Engineers / Engineering Geologists with 0-2 years experience are required for a consultancy in the UAE.

Tasks will include: site supervision; interpretive report writing; assistance with tender submissions; basic design. You will need a degree from the following list: BEng Engineering Geology & Geotechnics; BEng Civil Engineering; MSc Geotechnical Engineering or Engineering Geology.

Contact Natalie Pullin for full details: ++44 121 224 7944  
Natalie Pullin via LinkedIn <member@linkedin.com>

# ΠΡΟΚΗΡΥΞΕΙΣ ΒΡΑΒΕΙΩΝ ΚΑΙ ΔΙΑΓΩΝΙΣΜΩΝ ΓΙΑ ΓΕΩΤΕΧΝΙΚΟΥΣ ΜΗΧΑΝΙΚΟΥΣ



International Society for Rock Mechanics

ISRM

Infomail

## **ISRM 50th Anniversary Young Members' Slide Show Competition "The Future Directions for Engineering Rock Mechanics" Deadline is 15 July 2011**

If you are a member of the ISRM, aged 35 years or less during 2011, you are still in time to participate in the ISRM 50th Anniversary Young Members' Slide Show Competition. For the purpose you must prepare a PowerPoint slide show on your vision of "The Future Directions for Engineering Rock Mechanics".

The slide show must be presented in English and shall be fully explanatory, explaining, illustrating and justifying your ideas. It shall consist of exactly 40 slides and shall be submitted to the ISRM Secretariat not later than 15 July 2011 ([secretariat.isrm@lnec.pt](mailto:secretariat.isrm@lnec.pt)).

It is anticipated that the winner will be granted a financial contribution to the air travel costs (if necessary) plus free registration and inexpensive accommodation at both the Young Scholars' Symposium on Rock Mechanics and the ISRM Congress, which will take place coming October in Beijing.

Luís Lamas  
Secretary General, ISRM



We are proud to announce the launch of the **T&T International Awards 2011**, which promises to champion the industry's best efforts, greatest achievements and most impressive recoveries.

The awards aim to identify and applaud those that go above and beyond the call of duty to meet the testing demands of clients, budgets, schedule, geology and scope.

It is our pledge that these awards will not be a backslapping exercise for sponsors and supporters but instead will

stand as a testament to the true achievements of tunnellers and an opportunity for others to learn from them.

The entry criteria will be published on our website [www.tunnelsandtunnelling.com](http://www.tunnelsandtunnelling.com) along with a complete list of the judging panels.

Over the coming months we will be seeking entries that demonstrate ground breaking achievements, as well as innovative use of new and existing technologies, methods, equipment and practices.

The judging panels are in the process of being pulled together from the most experienced professionals and unbiased representatives of committees, societies and institutions.

The event will be held on Wednesday 7 December 2011 in Berlin, Germany.

Shortlisted entries will be announced on 1 November and the list published in the November issue of T&TI. A special awards supplement will be printed and distributed in Berlin and with the December issue of T&TI. The supplement will announce the award winners and also take a look at all of the shortlisted submissions.

All award entries are completely free of charge. We hope you get involved by nominating your projects and colleagues for awards, by supporting the event and by joining us in Berlin!

### **THE AWARDS**

#### **Category One: OVERCOMING ADVERSITY**

- **Foresight Award:** For the early identification and mitigation of a problem in design or construction
- **Endurance Award:** For completing a project in the face of numerous or persistent challenges
- **Tour de Force Award:** For successfully overcoming the greatest single challenge

#### **Category Two: SUSTAINABILITY**

- **Investor in Tunnellers Award:** For services to the education of tunnellers
- **Preservation Award:** For tunnelling with the lowest impact on the environment through design or construction methods
- **Lifetime Service to the Industry Medal:** For devotion and selfless service to tunnelling

#### **Category Three: INNOVATION**

- **Innovative use of Materials:** For the successful use of materials in unusual deployments
- **Innovative use of Equipment:** For the successful use of equipment in unconventional deployments
- **Innovative use of Instrumentation:** For the successful unusual use of instrumentation in site investigation, surveying or monitoring

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# ΑΝΑΣΚΟΠΗΣΗ ΓΕΩΤΕΧΝΙΚΩΝ ΕΚΔΗΛΩΣΕΩΝ



ΕΛΛΗΝΙΚΗ  
ΕΠΙΣΤΗΜΟΝΙΚΗ  
ΕΤΑΙΡΕΙΑ  
ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ  
& ΓΕΩΤΕΧΝΙΚΗΣ  
ΜΗΧΑΝΙΚΗΣ

## «Infrastructure Projects in Landslide-Prone Areas (Retaining measures, structures in unstable slopes)»

Η διάλεξη παρουσιάστηκε την Δευτέρα 9 Μαΐου στην Θεσσαλονίκη (στην Πολυτεχνική Σχολή του Αριστοτελείου Πανεπιστημίου Θεσσαλονίκης) και την Τρίτη 10 Μαΐου στην Αθήνα από τον Heinz BRANDL, Πολιτικό Μηχανικό, Καθηγητή και Chairman Institute for Soil Mechanics and Geotechnical Engineering του Technical University of Vienna.

Περίληψη της διάλεξης παρουσιάζεται στο προηγούμενο τεύχος των ΝΕΩΝ ΤΗΣ ΕΕΕΕΓΜ, ενώ οι διαφάνειες της διάλεξης έχουν αναρτηθεί στην ιστοσελίδα της ΕΕΕΕΓΜ ([www.hssmge.gr](http://www.hssmge.gr)).



## International Society for Soil Mechanics and Geotechnical Engineering Technical Committee TC301 Preservation of Historic Sites Meeting 16<sup>th</sup> May 2011, Rome

Στην 2<sup>η</sup> συνάντηση της επιτροπής για τη προστασία ιστορικών χώρων και μνημείων μετείχε το μέλος της ΕΕΕΕΓΜ Δρ. Δημήτριος Εγγλέζος, καθώς και οι:

Jean-Louis Briaud, Πρόεδρος ISSMGE  
Stefano Aversa, Πρόεδρος Italian Geotechnical Association  
Carlo Viggiani, Chairman της TC 301  
Yoshi Iwasaki, Vice Chairman της TC 301  
Alessandro Flora, Γραμματέας της TC 301  
John Burland (UK)  
Giovanni Calabresi (Italy)  
Nicoleta Ilies (Romania)  
Michele Jamiolkowski (Italy)  
Renato Lancellotta (Italy)  
Jean Launay (France)  
Sandro Martinetti (Italy)  
Efrain Ovando Shelley (Mexico)  
Jose Rodriguez Ortiz (Spain)

Επίσης παρευρέθη η Δρ. Δωρίνα Μουλλού, Αρχαιολόγος, στα πλαίσια της συνεργασίας της επιτροπής με άλλες ειδικότητες σχετικές με την προστασία μνημείων.



## Θεματολογία της Συνάντησης

1. Ενημέρωση των μελών της επιτροπής από τον καθηγητή Iwasaki για τη δραστηριότητα της Ασιατικής (υπο)επιτροπής
2. Συνάντηση της επιτροπής και διεξαγωγή συμποσίου στο Παρίσι στο πλαίσιο του 18<sup>ου</sup> συνεδρίου **ICSMGE**.
3. Ορισμός του 1<sup>ου</sup> επίτιμου/προσκεκλημένου ομιλητή για την «ομιλία/διάλεξη **Kerisel**»
4. Ιστοσελίδα επιτροπής
5. Δημιουργία ηλεκτρονικής βιβλιοθήκης
6. Κώδικες εφαρμογής και κανονισμοί γεωτεχνικών εφαρμογών σε μνημεία
7. Λοιπά θέματα.

Κατά τη συνάντηση αναπτύχθηκαν οι ακόλουθες απόψεις ανά θεματική ενότητα:

1. Ο καθηγητής Iwasaki παρουσίασε τη δραστηριότητα της Ασιατικής (υπο)επιτροπής (ATC 301), και δήλωσε την επιθυμία της (υπο)επιτροπής να αναφέρεται με την προγενέστερη ονομασία της ως ATC19. Δήλωσε ότι θα «ανεβάσει» στην ιστοσελίδα της TC301 τις επιστημονικές εργασίες (πάνω από 20) που παρουσιάστηκαν στο πρόσφατο Συνέδριο της ATC19 στο Χονγκ-Κονγκ. Επίσης, γνωστοποίησε την πρόθεση της ATC19 να οργανώσει ένα θεματικό συνέδριο στη Σαμαρκάνδη το Σεπτέμβριο του 2012. Σε κάθε περίπτωση θα κρατά συνεχώς ενήμερα τα μέλη της επιτροπής.
2. Κατ' αρχήν έγινε παρουσίαση από τον πρόεδρο της επιτροπής (Καθηγητής Viggiani) σχετικά με τα επικείμενα συνέδρια ενδιαφέροντος της επιτροπής TC301:
  - α. Διεθνές Συνέδριο στη Γεωτεχνική Σεισμική Μηχανική (ICEGE) με γενική θεματολογία «Από τα ιστορικά περιστατικά στην πρακτική εφαρμογή», προς τιμή του καθηγητή K.Ishihara (23-25 Ιανουαρίου 2012, Λούξορ, Αιγύπτος), όπου η θεματική ενότητα 7 είναι αφιερωμένη στα μνημεία (Historical Monuments Preservation).
  - β. Αθήνα, **XV ECSMGE**, 12-15 September 2011, Συνεδρία 6.2 - Μνημεία και ιστορικοί χώροι. Στο προεδρείο της συνεδρίας αυτής θα συμμετέχουν οι ακόλουθοι: M. Jamiolkowski (Ιταλία), V. Ulitsky (Ρωσία), ως προεδρεύοντες, C. Viggiani (Ιταλία), ως πρόεδρος της συζήτησης, K. Avellan (Φινλανδία), S. Aversa (Ιταλία), J. Burland (Μ. Βρετανία), G. Calabresi (Ιταλία), ως μέλη του προεδρείου, Εγγλέζος Δημήτρης, (Τεχνική Γραμματεία)

Ο πρόεδρος Briaud ανακοίνωσε ότι στο επόμενο συνέδριο της ISSMGE (Παρίσι, 2013) θα παρουσιασθούν 7 ειδικές προσκεκλημένες διαλέξεις, μεταξύ των οποίων και η διάλεξη Kerisel για τα μνημεία, διάρκειας περίπου 30



λεπτών (περιληπτική παρουσίαση της γραπτής εργασίας). Η εκτεταμένη γραπτή εργασία θα συμπεριληφθεί στα πρακτικά του συνεδρίου. Επ' αυτής της πρότασης ο καθηγητής Burland κατέθεσε την άποψη ότι – ενδεχομένως – η διάλεξη σε πλήρη έκταση θα πρέπει να δοθεί (και) σε άλλη περίπτωση (άλλος τόπος και χρόνος), ώστε να μην παρουσιαστεί μόνο σε περιορισμένη μορφή. Επιπλέον ο πρόεδρος Briaud ζήτησε την προώθηση και προσέλκυση εργασιών που εμπίπτουν στο αντικείμενο της TC 301 για το συνέδριο της ISSMGE στο Παρίσι, ώστε να υποβληθεί επαρκής αριθμός εργασιών και να διατεθεί πλήρης συνεδρία για την παρουσίασή τους. Σε μία τέτοια – ευκαία – περίπτωση η συνεδρία θα οργανωθεί με μέριμνα της επιτροπής TC 301.

3. Ως ομιλητής για την πρώτη διάλεξη προτάθηκε από τον πρόεδρο Viggiani ο καθηγητής Giovanni Calabresi. Η πρόταση έγινε ομόφωνα αποδεκτή από τους παρόντες.

4-5. Ο καθηγητής Lancellotta ανακοίνωσε ότι η νέα ιστοσελίδα της είναι ήδη έτοιμη και θα φιλοξενηθεί στην ιστοσελίδα της Ιταλικής Γεωτεχνικής Ένωσης (AGI), και συνεπώς εκεί μπορούν πλέον να ενταχθούν εργασίες σχετικές με το αντικείμενο της επιτροπής. Η πρόσβαση στο σχετικό υλικό δεν θα είναι άμεση, διότι θα προηγείται επιλογή από τους διαχειριστές της ιστοσελίδας (Flora και Lancellotta). Εφόσον, οι εργασίες έχουν θέματα πνευματικής ιδιοκτησίας, αυτό θα πρέπει να επισημαίνεται στους διαχειριστές, προκειμένου να γίνεται σχετική βιβλιογραφική αναφορά χωρίς διαθεσιμότητα του πλήρους κειμένου. Επί του θέματος της ιστοσελίδας ο Δημήτρης Εγγλέζος σημείωσε ότι ήδη υπάρχει υλικό από την ιστοσελίδα της προηγούμενης επιτροπής TC19 (πρόγονος της TC301), το οποίο πρέπει να ενσωματωθεί στην τρέχουσα ιστοσελίδα.

6. Σχετικά με τη σύνταξη οδηγιών ο πρόεδρος Viggiani πρότεινε τη συλλογή καλώς τεκμηριωμένων «ιστορικών περιστατικών» ως πρώτο βήμα για την άντληση γενικών κανόνων προσέγγισης μνημειακών δομών. Προς τούτο πρέπει να επιλεγεί μία τυπική μορφή παρουσίασης με ανάδειξη των κύριων παραμέτρων προσέγγισης (περιγραφή του προβλήματος, εδαφικές συνθήκες, αλληλεπίδραση εδάφους-μνημειακής δομής, περιορισμοί που απορρέουν από τις αναστηλωτικές αρχές, παρουσίαση των λύσεων κλπ). Ο καθηγητής Lancellotta συμπλήρωσε ότι κατά την συλλογή των ανωτέρω περιστατικών, θα πρέπει να γίνεται εκτεταμένη εισαγωγική αναφορά στο μεθοδολογικό πλαίσιο σχεδιασμού και μελέτης που είναι συμβατό με την επέμβαση σε μνημειακούς και ιστορικούς χώρους. Ο Δημήτρης Εγγλέζος επεσήμανε την ανάγκη διάδοσης και διάχυσης στην εδαφομηχανική κοινότητα των επικρατούσων αναστηλωτικών αρχών (λ.χ. Χάρτης της Βενετίας) ώστε να επέλθει εξοικείωση με το βασικό καταστατικό πλαίσιο γεωτεχνικής (και όχι μόνο) επέμβασης επί μνημειακών και γενικότερα ιστορικών χώρων.

7. α. Συμφωνήθηκε η σύνδεση με άλλους επιστημονικούς φορείς που πραγματεύονται το ίδιο αντικείμενο με αυτό της επιτροπής. Χαρακτηριστικά ο καθηγητής Burland πρότεινε τη σύνδεση με τις δραστηριότητες του ICOMOS. Ο καθηγητής Jamiolkowski πρότεινε το άνοιγμα της επιτροπής σε άλλες επιστημονικές ειδικότητες που σχετίζονται με το αντικείμενο (αρχαιολόγοι, δομοστατικοί μηχανικοί, γεωλόγοι κλπ). Πρόταση η οποία έτυχε ένθερμης υποδοχής από τον Πρόεδρο Briaud. Επί της τελευταίας πρότασης ο Δημήτρης Εγγλέζος παρουσίασε την ελληνική εμπειρία. Σύμφωνα με αυτή, η ενασχόληση με την μελέτη και το σχεδιασμό μέτρων προστασίας των μνημείων είναι διεπιστημονικό αντικείμενο, στο οποίο πρέπει να συμμετέχουν επιστήμονες από διαφορετικά πεδία, όπως, αρχαιολόγοι, αρχιτέκτονες, σεισμολόγοι, δομοστατικοί, τοπογράφοι, γεωλόγοι, συντηρητές, γεωλόγοι, και, φυσικά, εδαφομηχανικοί. Προς τούτο το Ελληνικό τμήμα της TC301 βρίσκεται σε φάση δημιουργίας μιας Ο-

μάδας Εργασίας αποτελούμενης από τις προαναφερθείσες ειδικότητες, με πρόσωπα που διαθέτουν εμπειρία στο αντικείμενο. Ο στόχος της Ομάδας Εργασίας είναι η αλληλεπίδραση και η ανατροφοδότηση επί θεμάτων σχετιζόμενων με τα μνημεία και η υποστήριξη των Ελλήνων μελών. Κατ' αυτό τον τρόπο δημιουργείται κατάλληλος διάυλος επικοινωνίας μεταξύ επιστημόνων διαφορετικών πεδίων, με ευθεία ανταντακλαση σε όφελος των μνημείων, όπως εξάλλου προκύπτει από την ήδη συσσωρευμένη εμπειρία. Στα πλαίσια, αυτής της πρακτικής, παρούσα στις εργασίες της επιτροπής, κατόπιν προσκλήσεως του Προέδρου της ΕΕΕΕΓΜ, ήταν η Δωρίνα Μουλλού (Δρ Αρχαιολόγος), μέλος της προαναφερθείσας Ομάδας Εργασίας.

β. Προτάθηκε από την Ελληνική πλευρά και έγινε κατ' αρχήν δεκτό από τα υπόλοιπα μέλη, η επόμενη συνάντηση της TC301 να γίνει το Σεπτέμβριο του 2011 στην Αθήνα, στο πλαίσιο της διεξαγωγής του ευρωπαϊκού γεωτεχνικού συνεδρίου (XV ECSMGE)



#### «Seismic Imaging from Tunnels and Galleries. Challenges and Benefits of Viewing the Sub-surface From Underground»

Η διάλεξη παρουσιάστηκε την Πέμπτη 19.05.2011 στο Αμφιθέατρο Πολυμέσων του ΕΜΠ από τον Dr. Calin Cosma, Γεωφυσικό, που έχει βάλει τις βάσεις και έχει αναπτύξει την μεθοδο των Cross-Hole Seismics.

Περίληψη της διάλεξης παρουσιάζεται στο προηγούμενο τεύχος των ΝΕΩΝ ΤΗΣ ΕΕΕΕΓΜ



ΕΛΛΗΝΙΚΗ  
ΕΠΙΣΤΗΜΟΝΙΚΗ  
ΕΤΑΙΡΕΙΑ  
ΕΔΑΦΟΜΗΧΑΝΙΚΗΣ  
& ΓΕΩΤΕΧΝΙΚΗΣ  
ΜΗΧΑΝΙΚΗΣ

#### «Μη Κορεσμένα Εδάφη»

Η διάλεξη παρουσιάστηκε την Δευτέρα 30 Μαΐου 2011 στην Αθήνα από τον Μιχάλη ΜΠΑΡΔΑΝΗ, Πολιτικό Μηχανικό, ΕΔΑΦΟΣ ΣΥΜΒΟΥΛΟΙ ΜΗΧΑΝΙΚΟΙ Α.Ε.

Περίληψη της διάλεξης παρουσιάζεται στο προηγούμενο τεύχος των ΝΕΩΝ ΤΗΣ ΕΕΕΕΓΜ, ενώ οι διαφάνειες της διάλεξης έχουν αναρτηθεί στην ιστοσελίδα της ΕΕΕΕΓΜ ([www.hssmge.gr](http://www.hssmge.gr)).



## ΗΜΕΡΙΔΑ ΚΑΝΟΝΙΣΤΙΚΟ ΠΛΑΙΣΙΟ ΑΣΦΑΛΕΙΑΣ ΦΡΑΓΜΑ- ΤΩΝ: ΔΙΕΘΝΕΙΣ ΕΜΠΕΙΡΙΕΣ ΚΑΙ Η ΠΡΟΤΑΣΗ ΤΗΣ ΕΕΜΦ

Την Τρίτη 7 Ιουνίου 2011 διεξήχθη στην Αίθουσα Τελετών του Κτηρίου Διοίκησης ΕΜΠ στην Πολυτεχνειούπολη Ζωγράφου ημερίδα με θέμα «Κανονιστικό Πλαίσιο Ασφαλείας Φραγμάτων : Διεθνείς Εμπειρίες και η Πρόταση της ΕΕ-ΕΜΦ».

Το πρόγραμμα της ημερίδας είχε ως εξής:

### Α' Μέρος

- 17:00 – 17:15 Κ. Αναστασόπουλος *Πρόεδρος ΕΕΜΦ* – Εισαγωγική Ομιλία
- 17:15 – 17:45 Gus Tjoumas *Ex FERC Director, Division of Dam Safety and Inspections - Dam Safety – The USA Federal Energy Regulatory Commission (FERC) experience*
- 17:45 – 18:15 Dr. Ing. Grethe Holm Midttomme *Head Engineer, The Norwegian Water Resources and Energy Directorate, Section for Dam Safety - Dam Safety – The Norwegian experience*
- 18:15 – 18:45 Prof. Antonio Pinheiro *Instituto Superior Técnico, Civil Engineering Department, Technical University of Lisbon - Dam safety – The Portuguese experience*

### Β' Μέρος

- 19:15 – 19:45 Δρ. Ν. Μουτάφης *Λέκτορας ΕΜΠ* – Παρουσίαση πρότασης κανονιστικού κειμένου ΕΕΜΦ για την ασφάλεια των φραγμάτων
- 19.45 – 20.30 Συζήτηση – Ερωτήσεις

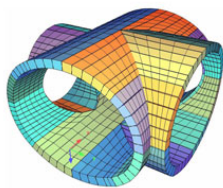
Στο πρώτο μέρος οι προσκεκλημένοι ομιλητές παρουσίασαν τα εφαρμοζόμενα στις χώρες τους κανονιστικά πλαίσια για την ασφάλεια των φραγμάτων, ενώ στο δεύτερο μέρος ο Δρ. Μουτάφης παρουσίασε την πρόταση της ΕΕΜΦ για Προεδρικό Διάταγμα για την «Σύσταση Διοικητικής Αρχής για την Ασφάλεια των Φραγμάτων».

# ΠΡΟΣΕΧΕΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΚΔΗΛΩΣΕΙΣ

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

GeoProc 2011 Conference Cross Boundaries through THMC Integration, 6 – 9 July 2011, Perth, Australia, [www.mech.uwa.edu.au/research/geoproc](http://www.mech.uwa.edu.au/research/geoproc)

International Symposium on Backwards Problem in Geotechnical Engineering and Geotechnical Failure and Monitoring -Towards ISO on Construction Control on Geotechnical Engineering, July 14 and 15, 2011, Nishi-ku, Osaka, Japan, Contact : Yoshinori Iwasaki at [yoshi-iw@geor.or.jp](mailto:yoshi-iw@geor.or.jp)



## ITACET Foundation Training Session Software Application in Tunnelling Hagenberg, Austria 14 - 15 July 2011 <http://www.itacet-software.com/>

The Seminar on Software Application in Tunnelling for comprehensive education and training of Tunnel Engineers, organised by the Research Institute for Symbolic Computation (RISC) and Softwarepark Hagenberg with the sponsorship of ITACET Foundation, focuses on the present state-of-the-art Software-controlled Methods in virtually all fields of Tunnel Engineering and Construction.

Planned activities include invited presentations, poster sessions, vendor exhibits and software demonstrations.

### Contact Information

Conference Secretariat  
Softwarepark Hagenberg  
Hauptstrasse 90, 4232 Hagenberg, Austria  
Tel.: +43 (0) 7236 3343 400  
Fax +43 (0) 7236 3343 590  
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15th African Regional Conference on Soil Mechanics and Geotechnical Engineering "Resources and Infrastructure Geotechnics in Africa: Putting theory into practice", Maputo, Mozambique, 18 – 21 July 2011, [www.15arcsmg-maputo2011.com](http://www.15arcsmg-maputo2011.com)

IGSH 2011 Fourth International Geotechnical Symposium Geotechnical Engineering for Disaster Prevention & Reduction, 26 – 28 July 2011, Khabarovsk, Russia, [www.igsh4.ru](http://www.igsh4.ru)



**15 - 18 August 2011, Johannesburg, Gauteng, South Africa**  
[www.pilingfoundationsafrica.com/Event.aspx?id=492886](http://www.pilingfoundationsafrica.com/Event.aspx?id=492886)

Building on the success of last year's Piling and Deep Foundations Africa conference we have taken all the elements that made it a success and have incorporated new and exclusive case studies into this year's event. Our aim is to ensure the best implementation of piling continues in Sub Saharan Africa.

**Piling and Deep Foundations Africa 2011** is the gathering place for engineers who want to drive innovation and sustainability while minimising project costs and time.

The agenda will be tailored specifically to Sub Saharan ground conditions and will revolve around the below key topics:

- Outlining best practice methods of pile load testing
- Innovative techniques in designing and constructing piles
- Understanding the various ground conditions

In this economic climate, it is essential to ensure your organisation is aware of the latest piling practices being implemented. This forum will combine the thoughts of leading piling engineers, project managers and geotechnical engineers to discuss and debate the latest trends and practices being implemented.

This strategic industry leading four-day event will provide exclusive case study presentations, best-practice discussions, regulatory updates and an exchange of innovative methods.

Contact [fran.lupton@iqpc.com](mailto:fran.lupton@iqpc.com) or call +2711 275 0457.



IS – SEOUL 2011 Fifth International Symposium on Deformation Characteristics of Geomaterials, Wednesday-Friday, Aug. 31 – Sep. 3, 2011, Seoul, Korea, [www.isseoul2011.org](http://www.isseoul2011.org)

EYGEC 2011 21st European Young Geotechnical Engineers' Conference, 4 – 7 September 2011, Rotterdam, Netherlands, [www.kiviniirja.net/EYGEC2011](http://www.kiviniirja.net/EYGEC2011)

ICoVP-2011, 10th biennial International Conference on Vibration Problems, September 5-8, 2011, PRAGUE, Czech Republic [www.icovp.org/index.asp](http://www.icovp.org/index.asp)

International Training Course on Disaster Risk Management of Cultural Heritage 2011, 10 - 24 September 2011, Kyoto and Kobe (Japan), <http://www.ritsumeigcoe.jp/heritaqerisknet.dmuch/itc/index.html>

6th International Symposium on Sprayed Concrete, 12-15 September 2011, Tromsø, Norway, [www.sprayedconcrete.no](http://www.sprayedconcrete.no)

XV European Conference on Soil Mechanics and Geotechnical Engineering, 12 – 15 September 2011, Athens, Greece, [www.athens2011ecsmge.org](http://www.athens2011ecsmge.org)

XV European Conference on Soil Mechanics & Geotechnical Engineering, Athens, September 12-15, 2011, Workshop on Education with the theme "Case histories in Geotechnical Instruction: Appropriate cases for each educational level", September 14, Wednesday pm. Organized by ERTC 16, Local host: Dr. Marina Pantazidou, [mpanta@central.ntua.gr](mailto:mpanta@central.ntua.gr) and [manoliu@mail.utcb.ro](mailto:manoliu@mail.utcb.ro)



**8TH WBI-INTERNATIONAL SHORTCOURSE**  
**on**  
**ADVANCED ROCK ENGINEERING**  
**September 15 to 19, 2011, Aachen, Germany**  
[wbi@wbionline.de](mailto:wbi@wbionline.de) , [www.wbionline.de](http://www.wbionline.de)

Based on the experience of 7 successful events, we have decided that the 8th International Shortcourse shall be focused more on Advanced Rock Engineering Issues.

We will cover fundamentals, analyses, tunnels, dams and slopes. Emphasis will be placed on case histories, design issues, exercises and discussions. The lecture notes, with a total volume of approx. 600 pages, will be distributed as paper copy and on CD Rom at the beginning of the course. They go along with a digital version of our two WBI-Print volumes no. 5 and 6.

**CONTENTS**

**Part 1 - Fundamentals**

Modelling: Stresses, strains, permeability  
Investigation: Mapping, drilling, adits, etc.  
Testing: Laboratory and in situ  
Exercises: Assessment of rock mass

**Part 2 - Analyses**

Wedge Type: Slopes, tunnel walls, dam abutments  
Finite Elements: Computer programs FEST03 and HYD03 (both programs are available for sale)  
Evaluation of section, boundary conditions  
Mesh generation and input data  
Representation of results, useful for design  
Exercises: Tunnels, slopes, dams

**Part 3 - Tunnels**

NATM: Excavation, support and lining

TBM: Type of TBM, cutting tools, face support, segmental lining

Design Concept: Engineering versus classification

Case Studies: NATM and TBM

Exercises: Analysis and design

**Part 4 - Dam foundation**

Investigation: Drillings, Lugeon tests, adits

Analyses: Dead weight, seepage, earthquake

Grouting, Drainage: Design

Monitoring: During and post construction

Case Studies, Exercises: Old masonry dam, RCC dam

**Part 5 - Slopes**

Investigation: Drillings, piezometers

Analyses: Wedge type, finite elements

Stabilization: Retaining structures, anchors, shotcrete, drainage

Case Studies: Big rock slide

Exercises: Back analysis of a slide

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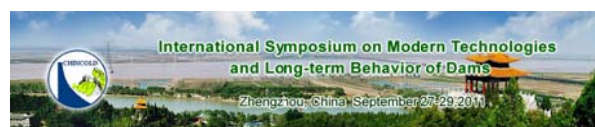
Email: [wbi@wbionline.de](mailto:wbi@wbionline.de)



Slope Stability 2011 International Symposium on Rock Slope Stability in Open Pit Mining and Civil Engineering, 18-21 September 2011, Vancouver, Canada, [www.slopestability2011.ca](http://www.slopestability2011.ca)

6<sup>th</sup> European Federation of Explosives Engineers World Conference, Lisbon, Portugal, 18th – 20th September 2011, <http://web.efee.eu/default.aspx>.

24<sup>th</sup> World Road Congress "Mobility, Sustainability and Development", 26 – 30 September 2011, Mexico City, Mexico, [www.piarcmexico2011.org](http://www.piarcmexico2011.org)



**International Symposium on Modern Technologies and Long-term Behavior of Dams**  
**September 27-29, 2011, Zhengzhou, China**  
[www.chincold.org.cn](http://www.chincold.org.cn)

Developing countries such as China, Iran and Turkey are being at the heart of dam construction and hydropower development in the world. Many challenging problems, arising in the dam construction, are well solved, while the summary and integration of those pathbreaking technologies is lagging. On the other hand, many early built dams in the world have been operated for years, some over 50 years or even 100 years, and hence some problems like aging and cracks begin to appear, which urgently need to be solved. To provide a platform for engineers and scientists to present and exchange their successful experiences in dam construction, management and rehabilitation, Chinese National Committee on Large Dams (CHINCOLD) and



other relevant organizations would like to sponsor an International Symposium on Modern Technologies and Long-term Behavior of Dams to be held in Zhengzhou, China during September 27-29, 2011.

The symposium will be a combined event of the 7th East Asian Dam Conference (EADC) and the 3rd International Conference on Long Term Behavior of Dams (LTBD). The EADC is a regional conference jointly sponsored by CHINCOLD, Japan Commission on Large Dams (JCOLD), and Korean National Committee on Large Dams (KNCOLD), which aims to promote the technical exchange and cooperation among East Asian countries in the field of dam technology. Since the 1<sup>st</sup> EADC in Xi'an China in 2004, it has been successfully held for 6 times by turns in China, Japan, and Korea. The LTBD conference is an international conference jointly sponsored by Chinese and Austrian universities, which aims to provide the opportunity for professionals to exchange their experiences and the latest developments related to the design, performance and rehabilitation of earth, rockfill and concrete dams. Up to now, it has been held for 2 times. The combination of the 7th EADC and the 3rd LTBD conference as "International Symposium on Modern Technologies and Long-term Behavior of Dams" will enrich the contents of symposium and enlarge the scale of participants.

It is great honor for the Organizing Committee to invite you to participate in the symposium, which will provide a forum for sharing of experiences by engineers, development planners, managers, manufacturers, environmentalists, consultants, academicians, users and others. We sincerely hope that this symposium will contribute significantly to promoting the worldwide spread of successful experiences in dam construction, management and rehabilitation.

We are looking forward to welcoming you in Zhengzhou China in September 2011.

#### Main Topics

- Methods of Design and Analysis for Dams
- Environment-friendly Technologies for Dam construction
- Long-term Operation and Maintenance of Dams
- Dam Rehabilitation and Upgrade
- Dam Safety Assessment and Risk Management
- Reservoir Management
- Others related to dams and reservoirs

#### Correspondence Address

All pre-registration forms, abstracts and correspondence concerning on the International Symposium on Modern Technologies and Long-term Behavior of Dams should be sent to Secretariat as the following;

Ms. Yao ZHANG

Secretariat of the International Symposium on Modern Technologies and Long-term Behavior of Dams

Chinese National Committee on Large Dams  
Room 1260, IWHR Building A, A1 Fuxing Rd., Beijing  
100038, P.R. China  
Tel: +86-10-68435228 Fax: +86-10-68712208  
Email: [chincold@126.com](mailto:chincold@126.com)  
Website: <http://www.chincold.org.cn>



### The Second ITALIAN WORKSHOP ON LANDSLIDES

## **LARGE SLOW ACTIVE SLOPE MOVEMENTS AND RISK MANAGEMENT WITH A SPECIAL SESSION ON LANDSLIDE HYDROLOGY**

### **HILLSLOPE HYDROLOGICAL MODELLING FOR LANDSLIDES PREDICTION**

**Naples, 28-30 September 2011**

**<http://iwl.unina2.it>**

As well as the 1st IWL, the Workshop is aimed at stimulating the debate about slope movements, which, in many countries, namely in Italy, cause every year big economic losses, and often even casualties. The selected theme is very delicate and complex, since it deals with the problem of the management of risk owing to large slow slope movements in areas with exposed goods (settlements, infrastructures and services). Scope of the Workshop is to share experience and results of international research, as shown by the broad participation of invited experts from many countries. To this aim, long time will be devoted to open discussion to delve into the proposed issues. The special session aims at discussing innovative hydrological research applied to landslide studies to improve our understanding of the spatio-temporal dynamics of slope movement mechanisms induced by precipitations.



XIV Panamerican Conference on Soil Mechanics and Geotechnical Engineering (October) & V PanAmerican Conference on Learning and Teaching of Geotechnical Engineering & 64th Canadian Geotechnical Conference, Toronto, Ontario, Canada, 2 - 6 October 2011, [www.panam-cqc2011.ca](http://www.panam-cqc2011.ca)

SARDINIA 2011, Thirteenth International Waste Management and Landfill Symposium, 3 - 7 October 2011, S. Margherita di Pula, Cagliari, Italy, [www.sardiniasymposium.it/sardinia2011](http://www.sardiniasymposium.it/sardinia2011)

The Second World Landslide Forum, "Putting Science into Practice", 3 - 9 October 2011, FAO Headquarters, Rome, [www.wlf2.org](http://www.wlf2.org)



## **TECHNICAL MEETING TC207 "Soil-structure Interaction and Retaining Walls"**

**October 5-8, 2011, Dubrovnik, CROATIA  
[www.georec.spb.ru/tc207/2011-Croatia](http://www.georec.spb.ru/tc207/2011-Croatia)**

After the reorganization of the Technical Committees of the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE), the Technical Committee TC38 "Soil-Structure Interaction" was renamed as TC207 "Soil-Structure Interaction and Retaining Walls". This Committee is gathering leading international geotechnical specialists who are making an effort to improve the knowledge of a very specific and fast growing geotechnical field. The an-

nounced meeting would be a great opportunity for them to exchange their knowledge and experience, and to present their contributions to the Committee main tasks.

The Croatian Geotechnical Society is honoured to invite members of TC207 and all those who are interested to participate in the Technical meeting and workshop of TC207 "Soil-structure Interaction and Retaining Walls", which will take place on 5-8 October 2011 in Dubrovnik, Croatia.

The meeting and workshop is organised by the Technical Committee TC207 "Soil-structure Interaction and Retaining Walls" ISSMGE and the Croatian Geotechnical Society "Hrvatsko geotehničko društvo" (HGD).

#### OBJECTIVES

The main objectives of the meeting and workshop are to provide the opportunity for members of the Technical Committee TC207 as well as other members of ISSMGE:

- (1) To present contributions in the field of soil-structure interaction and retaining walls analyses, and
- (2) To discuss their contributions to the main tasks they are engaged on:

1. *Guidelines on Soil-structure Interaction.*
2. *Retaining Walls.*
3. *Website of TC207*

- (3) To discuss the plans for future work of TC207

All further information can be received from:

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Tel: +385 1 4639 618



**4th Japan – Greece Workshop  
Seismic Design of Foundations,  
Innovations in Seismic Design, and  
Protection of Cultural Heritage  
October 6 (Thu) – 7 (Fri) , 2011, Kobe, Japan  
[www.civil.tohoku-gakuin.ac.jp/yoshida/4JGW](http://www.civil.tohoku-gakuin.ac.jp/yoshida/4JGW)**

Following the 1995 Kobe Earthquake a close scientific cooperation was initiated between the National Technical University of Athens (NTUA), Greece, and some Japanese institutes. As part of this cooperation a visit to Kobe of 25 graduating students from NTUA has taken place every year starting in 1999. In one of these visits an agreement was reached to organize this joint Japan-Greece Workshop. Starting in 2005, it was held successfully every two years.

The workshop serves as an international meeting at which specialists, governmental officials and professors in earthquake engineering and related fields may exchange ideas on the latest research results and technologies mainly on soil-foundation-structure interaction, seismic behavior of soft soil deposits, performance-based seismic design, lessons learned from recent earthquakes, innovations on seismic protection of structures, and seismic protection of monuments.

Researchers and engineers participated not only from Japan and Greece, but also from Algeria, China, France, USA, UK, India, Italy, and Germany.

The workshop strives to promote innovation, practice and safety in reducing the impact of earthquakes on our society and natural environment. We hope many participants will join this workshop to upgrade their knowledge and contribute to the progress of seismic disaster mitigation.

#### Workshop Topics

- Seismic analysis of shallow, embedded, and deep foundations
- Seismic design of foundations against liquefaction
- Site response of soil deposits
- Soil liquefaction and liquefaction-induced flow
- Remedial measures, repair-retrofit, and health monitoring of foundation-structure systems
- Performance-based design in geotechnical and structural engineering
- Innovations in seismic protection of structures and foundations
- Seismic protection of cultural heritage
- Lessons learned from recent earthquakes

#### Secretariat

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International Conference on Geotechnics for Sustainable Development GEOTEC HANOI 2011, 6 - 7 October 2011, Hanoi, Vietnam, [www.geotechn2011.vn](http://www.geotechn2011.vn)

Landslides and Geo-Environment, Geotechnical Symposium in Balkan Region, October 2011, Tirana, Albania, [fa-tos.cenalia@gmail.com](mailto:fa-tos.cenalia@gmail.com), [erjon.bukaci@gmail.com](mailto:erjon.bukaci@gmail.com)

60th Geomechanics Colloquy, October 13th and 14th, 2011, Salzburg, Austria, [www.oegg.at/index.php?id=20&L=2](http://www.oegg.at/index.php?id=20&L=2)

IBSBI 2011 International Conference on Bridges and Soil-Bridge Interaction, 13-15 October 2011, Athens, Greece, <http://ibsbi2011.ntua.gr>

2nd ISRM International Young Scholars' Symposium on Rock Mechanics, Beijing, China, October 14-16, 2011, [www.isrm2011.com](http://www.isrm2011.com)

Beijing 2011, 12<sup>th</sup> International Congress on Rock Mechanics – Harmonizing Rock Mechanics and the Environment, 16 – 21 October 2011, Beijing, China, [www.isrm2011.com](http://www.isrm2011.com)

HYDRO 2011 "Practical Solutions for a Sustainable Future", Prague, Czech Republic, 17-19 October 2011, [www.hydropower-dams.com](http://www.hydropower-dams.com)

2011 AFTES Congress "Espaces Souterrains de Demain", Lyon, France, 17 - 19 October 2011, [www.aftes.asso.fr/congres-presentation-organisation.html](http://www.aftes.asso.fr/congres-presentation-organisation.html)

International Conference on Deep Foundations and Problems of Underground Space Development, 18 - 19 October 2011, Perm - Ufa, Russia, Contact: [spstf@pstu.ac.ru](mailto:spstf@pstu.ac.ru)

LANDFILL 2011 Waste Management Facilities - The New Order, 18 - 20 October 2011, Durban, South Africa. Conference Chairman: [JohnPa@dmws.durban.gov.za](mailto:JohnPa@dmws.durban.gov.za)

XI INTERNATIONAL CONFERENCE UNDERGROUND INFRASTRUCTURE OF URBAN AREAS, 26-27 October 2011 Wroclaw - Poland, [www.uiua2011.pwr.wroc.pl](http://www.uiua2011.pwr.wroc.pl)

WCCE-ECCE-TCCE Joint Conference 2 SEISMIC PROTECTION OF CULTURAL HERITAGE, October 31 - November 1, 2011 Antalya, Turkey, [www.imo.org.tr/spch](http://www.imo.org.tr/spch)

3<sup>ο</sup> ΠΑΝΕΛΛΗΝΙΟ ΣΥΝΕΔΡΙΟ ΟΔΟΠΟΙΙΑΣ Νοέμβριος 2011, Πάτρα, [http://portal.tee.gr/portal/page/portal/INTER\\_RELATIONS/INT\\_REL\\_P/SYNEDRIA\\_EKDHLWSEIS/2011/3odopoiias](http://portal.tee.gr/portal/page/portal/INTER_RELATIONS/INT_REL_P/SYNEDRIA_EKDHLWSEIS/2011/3odopoiias)

ICAGE 2011 International Conference on Advances in Geotechnical Engineering, 7<sup>th</sup> - 9<sup>th</sup> November, 2011 - Perth, Australia, <http://www.icage2011.com.au>

AP-UNSAT 2011 5th Asia-Pacific Conference on Unsaturated Soils, 14 - 16 November 2011, Pattaya, Thailand [www.unsat.eng.ku.ac.th](http://www.unsat.eng.ku.ac.th)

SI11 9<sup>th</sup> International Conference on Shock & Impact Loads on Structures, 16 - 18 November 2011, Fukuoka, Japan, [www.cipremier.com](http://www.cipremier.com)



<http://qipremi.webs.com>

The First International Conference on Geotechnique, Construction Materials and Environment GEOMAT2011 will be held in Center Palace Miyako Hotel, Tsu city, Mie Japan in conjunction with Japan Geotechnical Society (JGS), Japanese Society of Irrigation Drainage and Rural Engineering (JSIDRE), Mie University, JCK Comp. Ltd and Glorious International. It aims to provide with great opportunities to share common interests on geo-engineering, construction materials, environmental issues, water resources, and earthquake and tsunami disasters. On Friday 11 March at 14:46 Japan Standard Time, the north east of Japan was severely damaged by the tragic earthquake and tsunami. The conference will be dedicated to the tragic Tohoku-Kanto earthquake and tsunami disasters. The organizers encourage and welcome enthusiastic participation and look forward to receiving contributions with in-depth multidisciplinary technologies towards new research and developments.

Conference themes:

- Advances in Composite Materials
- Computational Mechanics
- Foundation and Retaining Walls
- Slope Stability
- Soil Dynamics
- Soil-Structure Interaction
- Pavement Technology
- Tunnels and Anchors
- Site Investigation and Rehabilitation
- Ecology and Land Development
- Water Resources Planning
- Environmental Management
- Public Health and Rehabilitation
- Earthquake and Tsunami Issues
- Safety and Reliability
- Geo-Hazard Mitigation
- Case History and Practical Experience
- Others

Conference Secretariat:

Dr. Zakaria Hossain, Associate Professor  
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Graduate School of Bioresources  
Mie University, 1577 Kurima Machiya-cho  
Tsu-city, Mie 514-8507, Japan  
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Tel: +81-59-231-9578 Fax: +81-59-231-9591



2011 ICKGSS International Conference on Sustainable Application of Geosynthetics Technology Commemoration of 10<sup>th</sup> Anniversary of Korean Geosynthetics Society Foundation, 23 - 24 November 2011, Seoul, South Korea, Contact: [hyjeon@inha.ac.kr](mailto:hyjeon@inha.ac.kr)



**EUCEET Association Conference**  
**New trends and challenges in civil engineering education**  
**November 24-25, 2011, Patras, Greece**  
[www.euceet.upatras.gr](http://www.euceet.upatras.gr)

Conference themes

Under the general title: "New trends and challenges in civil engineering education", the Conference will be organized around three themes, for which 15 sub-themes/topics are proposed as follows:

1. Implementing the Curriculum: Types and trends in curriculum development and implementation
  - Implementation of the Bologna process - experiences with the two-tier system in civil engineering education in Europe

- Development of programmes with different orientations to cope with the needs of the profession
- Sustainability and civil engineering curricula
- The role of the civil engineer in mitigating natural hazards
- PhD Doctoral Schools in Civil Engineering

## 2. Improving the Curriculum: Best practices in teaching, learning and assessment

- Developing teaching techniques
- Open access learning, e-learning, open courseware
- Engineering education research and civil engineering instruction
- Assessing learning outcomes
- Quality assessment in civil engineering education

## 3. Extending the Curriculum: Lifelong learning, industry partnerships and international cooperation

- Lifelong learning in civil engineering
- University – industry partnership to enhance the role of the Civil Engineer in the knowledge economy
- Experiences in double diploma agreements
- Joint degrees at various levels
- A challenge for the civil engineering education in Europe: partnership with, expectations and needs from Chinese, Brazilian, Russian and Vietnamese Universities

Contributions covering other aspects of relevance to civil engineering education will be also taken into consideration.

### Contact and Address

Department of Civil Engineering  
University of Patras  
Patras, 26504, Greece

### Conference Secretariat

Eftychia C. Apostolidi  
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### Organising Committee (Chair)

Stephanos E. Dritsos  
Telephone: +30 2610 997780  
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International Symposium on Advances in Ground Technology and Geo-Information (IS-AGTG), 1-2 December 2011, Singapore, [www.is-agtg.com](http://www.is-agtg.com)



Signs of abnormal weather and climate change are evident nowadays, including rain-triggered landslides, riverbank and coastal erosions, flooding, rising sea levels, and many more. Geosynthetics are now being increasingly used for many applications in civil/geotechnical engineering including road and railway embankments, retaining walls, slope and erosion protection, drainage/filtration and seepage control, approach embankments, waste containment and lining, geocontainers, geobags, etc.

Thus, this International Symposium on Sustainable Geosynthetics and Green Technology for Climate Change (SGCC2011) will be held from 7 to 8 December 2011 at Grand Centara Convention Hotel, Bangkok, Thailand. This Symposium is hosted by the Asian Center for Soil Improvement and Geosynthetics (ACSIG) in the Geotechnical and earth Resources Engineering Program (GTE) under the School of Engineering and Technology (SET) at the Asian Institute of Technology (AIT), the Southeast Asian Geotechnical Society (SEAGS), the International Geosynthetics Society - Thailand Chapter (IGS-Thailand), and Suranaree University of Technology (SUT), under the auspices of the International Geosynthetics Society.

SGCC2011 will also serve as the Retirement Symposium for Prof. Dennes T. Bergado. Prof. Bergado started his research on probabilistic analyses of geotechnical properties and structures. Subsequently, he branched out to Ground Improvement and Geosynthetics. He established the ACSIG and initiated the IGS-Thailand. He published 2 books, more than 100 journal articles, and more than 200 conference papers mainly in this area. He pioneered the use of prefabricated vertical drain (PVD) in soft Bangkok clay with subsequent combinations of vacuum and heat preloading with notable applications in the Second Bangkok-International Airport as well as the Outer Ring Roads and Motorway Projects. He also did sustainable research work on recycled and lightweight geomaterials such as rubber tire chips mixed with sand. Currently, his research projects involve new creative ideas regarding deep cement mixing method (DMM) such as optimum mixing water contents, fundamental parameters as well as reinforced DMM called SDCM piles. His recent research works consist of risk reduction, sustainable mitigation of rain-triggered landslides, root reinforcement and soil erosions as well as ecological ground improvement and limited life geosynthetics (LLGs).

### Symposium themes:

- Roads/Railways/Transport Applications
- Flood Control/Reservoirs/Hydraulic Applications
- Mining/Waste Containment/Environmental Protection
- Ground Improvement/Remediation/Case Studies
- Reinforced Slopes/Walls and Geohazard Mitigations
- Geosynthetics for Renewable Energy
- Geocontainers and Geotubes
- Behavior of Unsaturated Soils/Rain-Triggered Landslides
- Earthquake Engineering/Geophysics
- Foundation Engineering/Retaining Walls
- Laboratory/Field Tests/Durability of Geosynthetics
- Sustainable Limited Life Geosynthetics (LLGs)
- Case Histories and Geosynthetics Innovations
- Sustainable Geosynthetics Engineering/Applications



For inquiries and more information required, please contact us at:

SGCC2011 Secretariat  
c/o Asian Center for Soil Improvement and Geosynthetics (ACSIG)  
GTE/SET, Asian Institute of Technology,  
P.O. Box 4, Khlong Luang, Pathumthani 12120 Thailand

Tel. No.: +66-2 524 5523  
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Email: [climatechange@ait.ac.th](mailto:climatechange@ait.ac.th) or [igs-thailand@ait.ac.th](mailto:igs-thailand@ait.ac.th)  
Website: <http://www.set.ait.ac.th/acsig/sqcc2011/>



**X<sup>TH</sup> REGIONAL ROCK MECHANICS SYMPOSIUM**  
**08-09 December 2011, Ankara, Turkey**  
[www.tukmd.org.tr/sempozyumlar/index\\_eng.php](http://www.tukmd.org.tr/sempozyumlar/index_eng.php)

Regional Rock Mechanics Symposia have been organized under the auspices of the Turkish National Society for Rock Mechanics (TUKMD) every two years. The VI<sup>th</sup>, VII<sup>th</sup>, VIII<sup>th</sup>, IX<sup>th</sup> Rock Mechanics Symposium were successfully organized with international participation on a regional basis in Konya, Sivas, Istanbul and Izmir. The X<sup>th</sup> symposium will be organized in Ankara, Turkey on December 08-09, 2011. All the engineers, researchers, designers and managers in the field of rock mechanics are invited to discuss their problems and research themes.

**Symposium goals**

- Encouraging the rock mechanics research in Turkey and its region.
- By contributing rock mechanics and its technology, developing a knowledge exchange opportunity and a knowledge-base which includes the ongoing studies and performing researches for regional countries.
- By highlighting the problems encountered during different rock engineering applications; encouraging the researchers to solve these problems which need solution.
- Presenting the rock mechanics studies performed in Turkey and its region and discussing the results obtained from them in regional basis.
- Addressing the rock mechanics and its outcomes to Turkish and regional country's people who should be realized that they have been living on rock masses.
- Forming a bridge among national, regional and international rock mechanics knowledge and related researchers.

**Symposium subjects**

- Original researches and new developments
- Theoretical and analytical studies
- Numerical methods
- Rock mechanics applications and tests
- Geotechnical and in-situ measurements
- Underground mining
- Slopes and open pit mining
- Quarrying
- Drilling-blasting and ground vibration
- Earthquake mechanism
- Mine shafts
- Underground excavations
- Subways and tunnels
- Foundation of dam and power stations

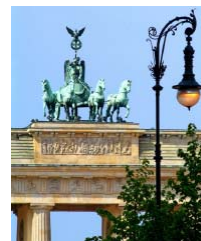
- Oil and natural gas repositories
- Radioactive waste storage
- Military storage facilities
- Geothermal energy applications
- Oil-exploration drilling
- Ground reinforcement studies
- Rock mechanics assessment in urban areas

**Correspondence address**

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4th International Conference on Grouting and Deep Mixing,  
February 15-18, 2012, New Orleans, Louisiana, USA,  
[www.grout2012.org](http://www.grout2012.org)



**3rd International Seminar on Earthworks in Europe**

**19 – 20 March, 2012, Berlin, Germany**

[www.fgsv.de/veranstaltungen\\_international.html?&x\\_julievents\\_pi1\[showUid\]=85&cHash=4153b585bc](http://www.fgsv.de/veranstaltungen_international.html?&x_julievents_pi1[showUid]=85&cHash=4153b585bc)

The 3rd International Seminar on Earthworks in Europe, organised by BA St (German Federal Highway Research Institute), FG SV (German Road and Transportation Research Association) and TUM (Munich University of Technology, Centre for Geotechnics) will take place in Berlin, Germany from 19th to 20th March 2012. The conference is a succession of the two conferences which took place successfully in Paris, France in 2005 and in London, United Kingdom in 2009. This international seminar is to be organised as the third of a planned long term series of events to discuss and promote technical progress and understanding of recent developments/issues in the design and construction of earthworks in European countries.

**It will seek to:**

- Promote the disciplines of Engineering Geology and Geotechnical Engineering in the design of earthworks for transport infrastructure,



- Encourage dialogue between earthworks professionals throughout Europe and the enhancement of pan European linkages and collaboration,
- Facilitate discourse on national practices and the establishment of European standards,
- Encourage an increase in coordinated earthworks research.

The conference should work out the European aspects of these subjects. Contributions from specialists from all over the world are invited to help to achieve these objectives. Participation in the conference will provide a common platform for earthworks professionals including engineers and geologists, project owners/clients, construction/project managers, general and earthworks contractors, supply chain partners and equipment manufactures.

#### MAIN TOPICS

1. Optimum use of material
2. Soil treatment
3. Quality control
4. European standards, CEN/TC 396
5. Soil classification
6. Geotechnical risk and performance
7. Measuring and mitigating environmental impact
8. Asset management and climate change
9. Sustainability for earthworks
10. Selected projects.

#### INFORMATION – COMMUNICATION

All interested persons are kindly asked to fill in and send the preliminary registration form to the address below. The 2nd announcement and other information will be sent only to those, who have returned the preliminary registration form to:

Forschungsgesellschaft für Straßen- und Verkehrswesen  
An Lyskirchen 14  
D-50676 Köln / Germany  
Phone: +49 / 221 / 93583-0  
Fax: +49 / 221 / 93583-73  
E-Mail: [koeln@fgsv.de](mailto:koeln@fgsv.de)



6th Colloquium "Rock Mechanics - Theory and Practice" with "Vienna-Leopold-Müller Lecture", 22-23 March 2012, Vienna, Austria, [christine.cerny@tuwien.ac.at](mailto:christine.cerny@tuwien.ac.at)

GeoCongress 2012 State of the Art and Practice in Geotechnical Engineering, Oakland, California, USA, March 25-29, 2012, [www.geocongress2012.org](http://www.geocongress2012.org)

TERRA 2012 XIth International Conference on the Study and Conservation of Earthen Architecture Heritage, 22 – 27 April 2012, Lima, Peru, <http://congreso.pucp.edu.pe/terra2012/index.htm>

GEOAMERICAS 2012 II Pan-American Congress on Geosynthetics, Lima, Perú, 2 – 5 May 2012 [www.igsperu.org](http://www.igsperu.org)

16<sup>th</sup> Nordik Geotechnical Meeting, 9-12 May, 2012, Copenhagen, Denmark [www.ngm2012.dk](http://www.ngm2012.dk)

ITA-AITES WTC 2012 "Tunnelling and Underground Space for a global Society", Bangkok, Thailand, 18 to 23 May, 2012, [www.wtc2012.com](http://www.wtc2012.com)

Fifth International Symposium on Contaminated Sediments: Restoration of Aquatic Environment, May 23 – 25 2012, Montreal, QC, Canada, [www.astm.org/SYMPOSIA/filtrexx40.cgi?+P+EVENT\\_ID+1857+/usr6/htdocs/astm.org/SYMPOSIA/callforpapers.frm](http://www.astm.org/SYMPOSIA/filtrexx40.cgi?+P+EVENT_ID+1857+/usr6/htdocs/astm.org/SYMPOSIA/callforpapers.frm)

EUROCK 2012 - ISRM European Regional Symposium - Rock Engineering and Technology, 27 – 30 May 2012, Stockholm, Sweden, [eva.friedman@svebe.se](mailto:eva.friedman@svebe.se)

SECOND INTERNATIONAL CONFERENCE ON PERFORMANCE-BASED DESIGN IN EARTHQUAKE GEOTECHNICAL ENGINEERING, May 28-30, 2012, Taormina, Italy, [www.associazionegeotecnica.it](http://www.associazionegeotecnica.it)

INTERNATIONAL SYMPOSIUM & SHORT COURSES TC 211 IS-GI Brussels 2012 Recent Research, Advances & Execution Aspects of GROUND IMPROVEMENT WORKS, 30 May – 1 June 2012, Brussels, Belgium, [www.bbri.be/go/IS-GI-2012](http://www.bbri.be/go/IS-GI-2012)

12<sup>th</sup> Baltic Sea Geotechnical Conference "Infrastructure in the Baltic Sea Region", Rostock, Germany, 31 May – 2 June, 2012, [www.12bsgc.de](http://www.12bsgc.de)

ISL 2012 NASL 11th International Symposium on Landslides, 3 ÷ 8 June 2012, Banff, Alta, Canada, [corey.froese@ercb.ca](mailto:corey.froese@ercb.ca), [www.ISL-NASL2012.ca](http://www.ISL-NASL2012.ca)

ASTM Symposium on Dynamic Testing of Soil and Rock: Field and Laboratory, June 28 – 29 2012, San Diego, CA, USA, [www.astm.org/D18symp0612.htm](http://www.astm.org/D18symp0612.htm)

International Conference on Geotechnical Engineering Education, 4-6 July 2012, NUI Galway, Galway, Ireland, [bryan.mccabe@nuigalway.ie](mailto:bryan.mccabe@nuigalway.ie)

ANZ 2012 "Ground Engineering in a Changing World" 11th Australia-New Zealand Conference on Geomechanics, Melbourne, Australia, 15-18 July 2012, [www.anz2012.com.au](http://www.anz2012.com.au)

Geotechnique Themed Issue 2012 "Offshore Geotechnics", [www.geotechnique-ice.com](http://www.geotechnique-ice.com)

34th International Geological Congress 5 ÷ 15 August 2012, Brisbane, Australia, <http://www.ga.gov.au/igc2012>

ICSE-6, 6th International Conference on Scour and Erosion, 27-31 August 2012, Paris, France, [www.icse-6.com](http://www.icse-6.com)

2nd International Conference on Transportation Geotechnics, 10 – 12 September 2012, Sapporo, Hokkaido, Japan, <http://congress.coop.hokudai.ac.jp/tc3conference/index.html>

EUROGEO5 - 5th European Geosynthetics Conference, 16 – 19 September 2012, Valencia, Spain, [www.eurogeo5.org](http://www.eurogeo5.org)

ISC' 4 4th International Conference on Geotechnical and Geophysical Site Characterization, September 18-21, 2012, Porto de Galinhas, Pernambuco – Brazil, [www.isc-4.com](http://www.isc-4.com)



# SAHC 2012

**8<sup>th</sup> International Conference on  
Structural Analysis of Historical Constructions**  
**October 15 – 17, 2012, Wrocław, Poland**  
[www.sahc2012.org](http://www.sahc2012.org)

SAHC - 2012 will bring together scientists, engineers, designers, architects, conservators and chemists who will present conservation research, theories, doctrines and achievements.

The main conference topic will be:

- Conservation of concrete, brick, stone and timber structures,
- Modernization and re-use of cultural heritage buildings,
- NDT technologies,
- Theory and practice of conservation,
- Repair and strengthening techniques,
- Rehabilitation and safety,
- History of construction, building technologies and materials,
- Analytical and numerical approaches,
- Experimental results and laboratory testing,
- Innovative and traditional materials / technology,
- Seismic behavior and retrofitting,
- Stabilization and valorization of historical ruins,
- Laser scanning.

The scientific program includes parallel sessions, poster session, and special session on safety of historical structures and new versions of standards.

During the Conference the companies will present innovative technologies related to the strengthening, conservation and repairs of traditionally erected and historical structures and testing equipment.

## SECRETARIAT OF SAHC 2012

Daria Gliniak, MSc  
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e-mail: [secretary@sahc2012.org](mailto:secretary@sahc2012.org)



**7<sup>th</sup> Asian Rock Mechanics Symposium**  
**15-17 October 2012, Seoul, Korea**  
<http://www.arms7.com>

The Korean Society for Rock Mechanics (KSRM) - Korean National Group of ISRM - extends a cordial invitation to the international community to attend the 7th Asian Rock Mechanics Symposium, an ISRM regional symposium. The event will be held on October 15-17, 2012 in Seoul, Korea; it is a timely celebration of the 1st Asian Rock Mechanics

Symposium that took place fifteen years ago in the same location.

The theme of the Symposium is 'The Present and Future of Rock Engineering.' The symposium intends to cover all aspects of rock mechanics, from theories to engineering practices, emphasizing the future direction of rock engineering technologies.

The venue for the symposium is located in the heart of Seoul, with convenient access to subways, restaurants and hotels. This event will be an excellent opportunity to contemplate the present and future of rock engineering, as well as to enjoy traditional and modern Seoul. On behalf of the KSRM, I am delighted to welcome all of you and look forward to meeting you in Seoul.

Dr. Kong-Chang Han, President of KSRM

ARMS 2012 Secretariat  
Main 810, Korea Science & Technology Center, 635-4,  
Yeogsam-dong, Kangnam-gu, Seoul 135-703, Korea  
Tel. +82-2-558-1896, Fax. +82-2-558-1897,  
Email: [webmaster@ksrm.or.kr](mailto:webmaster@ksrm.or.kr)



International Conference on Ground Improvement and Ground Control: Transport Infrastructure Development and Natural Hazards Mitigation, 30 Oct - 2 Nov 2012, Wollongong, Australia [www.icgiwollongong.com](http://www.icgiwollongong.com)

ACUUS 2012 13th World Conference of the Associated Research Centers for the Urban Underground Space Underground Space Development - Opportunities and Challenges, 7 - 9 November 2012, Singapore, [www.acuus2012.com](http://www.acuus2012.com)

32. Baugrundtagung with exhibition "Geotechnik", Mainz, Germany, 26 - 29 November 2012

GEOSYNTHETICS ASIA 2012 (GA2012) 5th Asian Regional Conference on Geosynthetics, Bangkok, Thailand, 10 - 14 December 2012, [www.set.ait.ac.th/acsig/igs-thailand](http://www.set.ait.ac.th/acsig/igs-thailand)

First International Congress FedIGS, 12 - 15 November 2012, Hong Kong - China, [www.fedigs.org/HongKong2012](http://www.fedigs.org/HongKong2012)



**GA2012 - Geosynthetics Asia 2012**  
**5th Asian Regional Conference on Geosynthetics**  
**10 - 14 December 2012, Bangkok, Thailand**  
[www.set.ait.ac.th/acsig/GA2012](http://www.set.ait.ac.th/acsig/GA2012)

The theme of this Conference is "Geosynthetics for Sustainable Adaptation to Climate Change".

The effect of climate change including global warming is not only limited in causing landslide disasters but also in increasing the frequency of occurrence of a variety of natural disasters. The intergovernmental panel on climate change (IPCC) reported that residences of many more millions of people are projected to be flooded every year through the 2080s because of rising sea level. Among at risk are lowlying and densely populated areas. Moreover,

recent news items have identified that insurance companies are blaming bad weather slashing down their profit forecasts by millions of dollars. Consequently, the insurance companies have been forced to raise the insurance premium to recoup their losses

Contact person: GA2012 Secretariat

E-mail: [igs&#8208;thailand@ait.ac.th](mailto:igs&#8208;thailand@ait.ac.th) or [acsig@ait.ac.th](mailto:acsig@ait.ac.th)



Geotechnical Special Publication, ASCE "Foundation Engineering in the Face of Uncertainty". Abstracts to Mohamad H. Hussein at: [MHussein@pile.com](mailto:MHussein@pile.com).

Geotechnical Special Publication, ASCE "SOUND GEOTECHNICAL RESEARCH TO PRACTICE", [http://web.engr.oregonstate.edu/~armin/index\\_files/Holtz\\_GSP](http://web.engr.oregonstate.edu/~armin/index_files/Holtz_GSP)

Fifth International Conference on Forensic Engineering Informing the Future with Lessons from the Past, 15-17 April 2013, London, United Kingdom, <http://ice-forensicengineering.com>



[www.elabs10.com/content/2010001471/SIP%202013.pdf](http://www.elabs10.com/content/2010001471/SIP%202013.pdf)

In 2013 Géotechnique will be holding a Symposium in Print on Bio- and Chemo- Mechanical Processes in Geotechnical Engineering. A special edition of Géotechnique will be published to coincide with a one-day symposium at The Institution of Civil Engineers in London.

In recent years substantial advances have been made in understanding the coupling between chemical and biological processes and mechanical and hydraulic behaviours in soils and rocks. At the same time, experimentation and modelling capabilities have progressed significantly, allowing effective design of geotechnical applications. The need for such analyses arises (for example) in chemical and biological soil improvement; nuclear, hazardous and municipal waste containment; petroleum and natural gas extraction; methane hydrate exploitation; CO2 sequestration; and assessment of pavement durability.

This symposium will provide a forum to take stock of different approaches to the experimental characterisation, constitutive modelling and design/monitoring of geotechnical engineering applications. Abstracts (limited to 200 words) are invited for papers concerning, but not limited to the following subject areas. Abstracts focusing on practical applications and case studies are particularly welcome.

- Experimental analysis and constitutive modelling of the bio- and chemo-mechanical behaviour of geomaterials.
- Effects of changes in the pore water chemistry on soil and rock behaviour.
- Short-term (osmotic) versus long-term (chemical/bio weathering) processes.
- Interactions between geometrical scales of diverse biological, chemical, physical and mechanical processes.
- Fundamental mechanisms of bacteria-driven mechanical improvement of soils and the role of bacteria in changing and controlling geotechnical properties.
- Case studies of chemical and biological soil modifications.
- Applications of bio- and chemo-mechanical models in emerging technologies.

If you would like to contribute a paper to this Symposium, email an abstract of your proposed paper by 30 September 2011 (Sohini Banerjee, [sohini.banerjee@icepublishing.com](mailto:sohini.banerjee@icepublishing.com)) Submissions will be subject to two-stage review. Initial selection of abstracts will be made by the SIP 2013 Editorial Panel. Authors of selected abstracts will be asked to submit their papers by 1 March 2012. Selection of papers to be published will be on the basis of full peer review.



Conference to Commemorate the Legacy of Ralph B. Peck, 7th International Conference on Case Histories in Geotechnical Engineering & Soil Dynamics and Symposium in Honor of Clyde Baker, Chicago, USA, April/May, 2013, <http://7icchgq.mst.edu>

ITA-AITES WTC 2013 "Underground – the way to the future", Geneva, Switzerland, 10 to 17 May 2013, [www.wtc2013.ch/congress](http://www.wtc2013.ch/congress)

18<sup>th</sup> International Conference on Soil Mechanics and Geotechnical Engineering "Challenges and Innovations in Geotechnics", 1 – 5 September 2013, Paris, France [www.paris2013-icsmge.org](http://www.paris2013-icsmge.org)

**EUROCK 2013**  
**ISRM European Regional Symposium**  
**Rock Mechanics for Resources, Energy and Environment**  
**23-26 September 2013, Wroclaw, Poland**

Contact Person: Prof. Dariusz Lydzba  
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ANDORRA 2014 14th International Winter Road Congress  
2014, 4-7 February 2014, Andorra la Vella (Andorra),  
[www.aipcrandorra2014.org](http://www.aipcrandorra2014.org)



[www.numge2014.org](http://www.numge2014.org)

The European Regional Technical Committee ERTC7 – Numerical Methods in Geotechnical Engineering has the pleasure of inviting you to attend the 8th European Conference in Delft, The Netherlands, 18-20 juni 2014.

This conference is the eighth in a series of conferences organized by the ERTC7 (Numerical Methods in Geotechnical Engineering) under the auspices of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE).

One of the first conferences of this series was held in 1986 in Stuttgart, Germany and continued every four years (1990 Santander, Spain; 1994 Manchester, United Kingdom; 1998 Udine, Italy; 2002 Paris, France; 2006 Graz, Austria; 2010 Trondheim, Norway).

The conference provides a forum for exchange ideas and discussion on topics related to geotechnical numerical modelling. Both, senior and young researchers, scientists and engineers from Europe and overseas are invited to attend this conference to share and exchange their knowledge.

#### Conference Themes

The NUMGE 2014 organisers kindly invite researchers and practitioners in the field of geotechnical engineering to submit abstracts on scientific achievements, innovations and engineering applications related to or employing numerical methods.

Abstracts on theoretical subjects could be related (but are not limited) to one of the following topics:

- Constitutive modelling, including cyclic loading, anisotropy, structure, creep and large deformations
- Finite elements, discrete elements, boundary elements, finite differences, meshless and mesh free methods
- Coupled analysis and unsaturated soil behaviour
- Dynamic, seismic and earthquake analysis
- Heterogeneity and probabilistic analysis
- Neural networks

The organisers explicitly welcome abstracts on practical matters related (but not limited) to the following types of applications:

- Dams, embankments and slopes
- Excavations and retaining walls
- Shallow and deep foundations
- Tunnels and mining applications
- Reinforcements and ground improvements
- Offshore applications
- Geothermal and geo-energy applications
- Regularisations and codes

For practical information, please contact:

Mrs. Hannie Zwiers - Conference Secretariat

Technische Universiteit Delft,  
Faculty CiTG  
Stevinweg 1  
2628 CN Delft,  
The Netherlands

Phone: +31 - 15 27 88100  
E-mail: [H.H.M.Zwiers@tudelft.nl](mailto:H.H.M.Zwiers@tudelft.nl)

For scientific information, please contact:

Prof. Michael Hicks - Conference Chairman

Technische Universiteit Delft,  
Faculty CiTG Geotechnical Laboratory  
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2628 CN Delft,  
The Netherlands

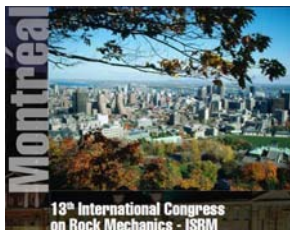
Phone: +31 - 15 27 87433  
E-mail: [M.A.Hicks@tudelft.nl](mailto:M.A.Hicks@tudelft.nl)



10th International Conference on Geosynthetics – 10ICG, Berlin, Germany, 21 – 25 September 2014 [www.10icg-berlin.com](http://www.10icg-berlin.com)







**13<sup>th</sup> ISRM International Congress on Rock Mechanics  
Innovations in Applied and Theoretical  
Rock Mechanics  
29 April – 6 May 2015, Montreal, Canada**

The Congress of the ISRM "Innovations in Applied and Theoretical Rock Mechanics" will take place on 29 April to 6 May 2015 and will be chaired by Prof. Ferri Hassani.

Contact Person: Prof. Ferri Hassani  
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# ΝΕΑ ΑΠΟ ΤΙΣ ΔΙΕΘΝΕΙΣ ΕΝΩΣΕΙΣ



## **Small in-pit radar increases safety in open cut mines**

Always on the minds of persons working within open cut pits is the possibility for sections of a wall to detach suddenly and, with minimal warning, bring down tonnes of rock.

Since 2003 one of the most significant contributions to in-pit safety has been the development, application and refinement of in-pit radar for monitoring wall movement. Radar systems are now in use throughout the world. These systems have been designed to continuously monitor entire walls, or even entire pits, for 24 hours a day, 7 days a week.

There has however not been an easy to use rugged mobile system available that is specifically designed to target just the work zone around where a crew is working.



To address this issue, GroundProbe ([wam.groundprobe.com](http://wam.groundprobe.com)) has released the Work Area Monitor (WAM). The WAM is a small high resolution radar that is mounted on a light mine vehicle which enables it to be deployed quickly to a work zone. Once there, it can be set up and running in less than a minute; a camera and radar enabling the work crew to quickly select the area to be monitored. The system continuously monitors that area for movements of large rocks or loose material as opposed to bench sized movements monitored by larger in-pit radar systems.

When the WAM detects movement it alerts the work crews via wireless Personal Alerts that display emergency text messages, audio, visual and vibrating alerts while at the same time sounding local lights and sirens to warn miners.

Tony Meyers  
ISRM Vice President for Australasia

## Rensselaer Civil Engineering Students Take First Prize at National GeoChallenge Competition

### Students Constructed Winning Model of Earthen Wall Using Paper, Tape, and Poster Board

A team of undergraduate and graduate students from Rensselaer Polytechnic Institute recently won the 2011 National GeoChallenge for their innovative earth wall design.

The annual competition, sponsored by the American Society of Civil Engineers (ASCE) Geo-Institute, pits teams of university students against each other in a very structural, earthy competition: using sand as a meaningful, weight-bearing construction medium.

The Rensselaer team placed first among the 16 finalist university teams invited to compete in March at the ASCE 2011 GeoFrontiers conference in Dallas. For their victory, the Rensselaer team received the Atterberg Cup at the awards ceremony, attended by more than 2,000 members of the international civil engineering community.

"I was very confident in our team. We spent a lot of time on our design, and we tried as hard as we could," said Rensselaer team leader Andrew Yeskoo, a senior civil and environmental engineering major. "It was a great few days at the competition and attending the conference. Plus, it was excellent that we won."

Along with Yeskoo, Rensselaer GeoChallenge team members include civil engineering undergraduates Tamara Desrosiers, Meghan Hatton, and Heather Higgins, as well as civil engineering graduate students Maggie Exton and Waleed El-Sekelly. Many of the students work in the Rensselaer [Center for Earthquake Engineering Simulation](#) (CEES) with Research Engineer Anthony Tessari and Professor Tarek Abdoun.

"The National GeoChallenge Competition is a great opportunity for our students to apply their technical knowledge and show their outstanding engineering talent as they compete with the top schools in the nation," said [Abdoun](#), faculty adviser to the Rensselaer GeoChallenge Team, and the Judith and Thomas Iovino '73 Professor in Civil Engineering and associate dean for research in the School of Engineering. "I am extremely proud of our student team. They worked very hard in all phases of this competition, and they certainly deserve such a prestigious award."

The GeoChallenge team started their material testing and designs in October. The challenge involves designing and building reinforcements for a mechanically stabilized earth (MSE) wall using limited materials. MSE walls, commonly used for bridge embankments, dams, and dikes, are generally made using soil reinforced with steel or geotextiles. In the GeoChallenge competition, the MSE walls were made from poster board, and the reinforcements had to be constructed solely of paper and attached with adhesive tape.

All of the GeoChallenge teams had a large wooden box with no top and a removable side. Students used their paper MSE wall as the missing box side, and the competition tested if the MSE wall could support the specified load without failing. The box was filled with sand and soil, and the

goal is to use the least amount of paper and tape reinforcement on the MSE wall to support the load.

"In a real-world situation, the less reinforcement material you use, the less expensive the overall structure would be to construct," Yeskoo said. "MSEs are neat because they're relatively cheap to build as compared to big metal structures, and because you're actually using the soil as a construction medium."

Yeskoo said the competition was considerably more challenging this year than in past years, as the competition tested surface load as well as lateral load. The Rensselaer team's design supported 50 pounds of surface load, along with 25 pounds of lateral load — while using only 5.7 grams of reinforcing material.

(Michael Mullaney / RPI News, 4<sup>th</sup> May 2011)



## Early warning system could predict landslides weeks in advance

The creators of a new avalanche early-warning system claim it could help predict catastrophic landslides weeks or even months before they happen.

The technology could be as much as five times cheaper than existing methods and can operate continuously instead of only providing measurements every few weeks, say the researchers from two Munich universities who developed the system.

The alpEWAS (early warning system for Alpine slopes) uses a combination of underground cables and a surface-based video camera and laser scanner to detect and measure movement.

It also includes low-cost GPS antennas to measure surface movement and a piezometer for measuring the pressure of water in the ground, known as the water table.

Computer software then compares this information with data on previous ground movements to estimate how much activity is likely to take place in a certain time and to raise alerts if certain triggering factors occur.

Teams from the Technical University of Munich (TUM) and Bundeswehr University Munich (UniBW) have been testing the system, which cost €500,000 to develop, at a site in the Alps for over two years, gathering information about the soil movement.

"We wanted to know how the triggering factors like rainfall and the build up of the water table influenced the velocity of the movement," TUM's engineering geology chair professor, Kuroschi Thuro, told *The Engineer*.

"We've seen that when a large rainfall comes, like 60mm or more in 24 hours, we know that there is a build-up of the water table and the movement starts about two to three days after."

"We expect that we would see a more catastrophic failure very early, maybe weeks or months before when something is changing in the slope. It normally starts with larger movements in a shorter timeframe, and we expect to be able to see that weeks beforehand."

To detect ground movement, alpEWAS uses an underground co-axial cable similar to those used to connect TV

aerials. The moving soil squeezes the cable and changes the electrical signal passing through it, which can be used to pinpoint and quantify the movement.

A video-tachometer measuring device is also used to detect surface movement at a distance of up to 200m depending on the air quality, complemented by a laser scanning device that provides additional data.

Thuro said the system needs to collect data for at least one summer and preferably over one year to build up an accurate picture of soil movement at any one site.

He added that the technology was more cost-effective than existing underground probes when used on larger sites that would require five to ten boreholes. 'It's not easy to predict but it could be up to five times cheaper than a traditional system.'

The alpEWAS team is working with several consultants at sites in Germany, Switzerland and Austria to install the system and is hoping to develop it for commercialisation.

([Stephen Harris](#) / The Engineer, 11 May 2011)



### **Earthquake early warning system helped save lives in Japan**

TOKYO (AP) — Though earthquakes can't be predicted, experts say an early warning system that detects the earth's rumblings before they can be felt saved countless lives when Japan's once-in-a-millennium disaster struck two months ago.

Millions of Japanese live in areas, including Tokyo, that are in high risk of being hit by major quakes at virtually any time, and over the last decade or so Japan has invested heavily in its early warning system, which is the most advanced in the world.

Despite the massive destruction wrought by March's magnitude-9.0 earthquake and the tsunami it spawned, experts say it could have been worse had Japan not been so prepared.

"I think it saved many people," Kunihiro Shimazaki, a leading seismologist and head of the government's earthquake prediction advisory board, said Thursday. "Particularly with the tsunami warning, it gave people time to act."

Japan has poured some \$500 million into a sophisticated network capable of detecting the first vibrations of an earthquake, called "P waves." These initial pulses do not create a lot of shaking and travel much faster than the killer shock waves that follow.

The network of sensors, launched as the world's first in 2007, record the P waves and relay the information to computers that then calculate how big the quake will be.

Before the ground ever started rocking on March 11, warnings a huge quake was about to strike flashed across TV screens, were broadcast over radio stations and arrived on mobile phones. Alerts were also sent to halt trains and factories.

The heads-up it gave was brief — in Tokyo, about 230 miles (370 kilometers) from the epicenter, messages with alarms interrupted TV programming only about 10 seconds before the hard jolts began.

But those 10 seconds could be vital, said Roger Musson, a seismologist at the British Geological Survey.

"In terms of the safe shutdown of mechanical systems, factory outputs and bullet trains, then it seems to have worked really well," he said. "Ten seconds is time to turn the gas off if you're cooking, and that could make all the difference between your house burning down or not."

Still, Shimazaki warned that completely quake-proofing a country like Japan is impossible, and said the early warning system had its faults.

Many of its sensors were quickly knocked out by the quake or the waves, and, because of the intensity and number of shocks, the ones that worked provided an overwhelming amount of information that made interpretation difficult.

"There were some really simple problems that need to be fixed," he said, and scientists are working on improving protections for sensors and the means of interpreting data.

Surviving an earthquake, however, largely depends on preparedness, and Shimazaki said few experts had foreseen the possibility of a magnitude-9.0, the most powerful quake in Japan's history.

While Japan maintains strict building codes and has financed the construction of high sea walls in coastal areas, they were overrun by the tsunami. The quake and tsunami left 25,000 dead or missing, and more than 100,000 remain in temporary shelters.

Shimazaki said the Fukushima Dai-ichi nuclear plant — which suffered explosions and fires, spewed radiation and continues to be unstable — was a good case of underestimated risk.

He said experts had long thought Fukushima was a relatively low-danger area because over the past 400 years it had only been hit twice, in the 1930s, by jolts in the magnitude 7 range. He noted that another plant in an area considered much more volatile, has been shut down until safety improvements can be made.

"We are gradually getting to a point where we can understand things much better," he said. "We have many things to reflect on, and regrets about things that we might have done differently. But our role is to see that improvements are made."

(Margie Mason / The Associated Press, May 12, 2011)



### **Taiwan develops technology for predicting slope collapse**

A National Chiao Tung University research team has developed fiber optic sensor monitoring technology to predict slope collapse probability and resulting amounts of sediment in reservoirs to a high degree of accuracy.

"The technology could be of assistance in precautionary removal of sediment and allocation of downstream water resources," said team leader Huang An-bin, a professor in the university's Department of Civil Engineering, May 11.

"We hope this innovation will facilitate the development of disaster prevention technology," Huang said.



The research team used fiber Bragg grating as the core sensor component in devising their fiber grating water pressure and ground movement sensor technology, Huang explained.

Using the small computer system interface method, the sensors were then installed in the ground to carry out automatic monitoring of water pressure and displacement distribution.

According to Huang, the team used this technology to simulate conditions in the Shihmen Reservoir catchment area during Typhoon Krosa in 2007 and the result matched actual slope collapse and sediment volume with an accuracy of 98.7 percent.

Huang said that when current electronic sensor equipment is used for monitoring sloping land, it is prone to damage by lightning and moisture. Also, the equipment is susceptible to electromagnetic wave interference, he added.

He said it is difficult to install multiple monitoring points on a single signal transmission line with the current technology, and as a result, the transmitted signals are very weak.

The system has been installed at Shihmen Reservoir, the Guanxi section of National Highway No. 3 and Alishan National Scenic Area, Huang said. (SB)

(Taiwan Today, 12<sup>th</sup> May 2011)

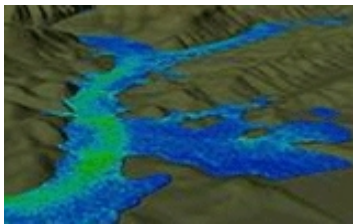


### **Modelling technique assesses the impact of dam collapse**

**Chinese and Australian scientists have developed modelling techniques to help understand the full impact of flooding that occurs when dams collapse.**

The work by China's Satellite Surveying and Mapping Application Centre and Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) will help disaster-management authorities better understand the full impact of the catastrophic flooding.

The team modelled the effects of a failure of the massive Geheyan Dam in China's Hubei province. They simulated the impact of flooding on the surrounding region and its infrastructure if the dam suddenly released its 3.12 billion cubic metres of water.



Dam failure is of particular concern in China because many of the country's 70,000 dams are in regions prone to earthquakes.

'We modelled six different dam-failure scenarios,' said CSIRO computational scientist, Dr Mahesh Prakash. 'Our simulations show where the water would go, how fast it would reach important infrastructure such as power stations and the extent of inundation in major townships downstream.'

CSIRO's approach combines data that changes over time — the water flow — with static landscape data from a Geo-

graphic Information System to show how infrastructure will be affected.

'The modelling technique we developed for this work is really powerful,' Dr Prakash said. 'It gives us very realistic water simulations, including difficult-to-model behaviours such as wave motion, fragmentation and splashing.'

The team at CSIRO used the same technique and software to model other catastrophic geophysical flow events such as tsunamis, floods, storm surges, as well as landslides and volcanoes. The technique was tested by modelling the 1928 St Francis dam break in California, which produced a very accurate simulation of what happened in real life.

The project is funded under the Australia-China Environment Development Partnership by the Australian Agency for International Development.

What happens when 3.12 billion cubic meters of water suddenly comes crashing down from a dam towards a town below? CSIRO computational scientists are modelling the hypothetical collapse of the massive Geheyan dam in China. Check out this video to see how they did it and what the dam break looks like (<http://www.theengineer.co.uk/1008961.article?cmpid=TE01&cmptype=newsletter&cmptype=030611#video>).

(The Engineer, 9 June 2011)



### **Engineer: Part of parish sinking**

While it's a widely known fact that New Orleans and other cities along south Louisiana's coastline are sinking at varying rates, a local civil engineer said an area in Lafayette Parish is also sinking.

The technical term for it is subsidence, and Paul Miers, of Paul Miers Engineering, said land within a 10-mile radius of Acadian Village is doing just that.

Using original elevation benchmarks set in the late 1920s as a base point, the Federal Emergency Management Agency's contour maps made using aerial technology showed the ground had sunk 18 inches by 2003.

That stretch of land includes Acadiana Mall and the Regional Medical Center of Acadiana, going south to Maurice.

"It's kind of a big circle," Miers said.

It likely has sunk more since then, he added.

The possible causes for subsidence include the movement of tectonic plates far below the surface of the earth, removal of fluids — including petroleum and at higher levels, water from aquifers — as well as consolidation of soils. None have been specifically pinpointed as the cause.

Bryan Guidry, chief civil engineer with the Lafayette Utility System, which has seven water wells in the area as well as a water treatment facility, said he'd never heard that the land was sinking.

"I'd assume you could see some indication on the buildings and structures," Guidry said. "But as far as I know, there's nothing to indicate that."

Terry Huval, director of LUS, said there are "a number of layers of earth between the top of the ground" and the Chicot Aquifer, which supplies water for the parish.

"No one has ever indicated that was an issue and if it was, it would have affected the major treatment facility," Huval said. "By all indications, that is very stable."

In response to their comments, Miers said one wouldn't necessarily see cracks or fissures in structures or their foundations because the overall area of land that is sinking is so vast.

"It isn't something you'd notice driving down the road," he said.

The matter could affect property owners in the area if they try to get elevation certificates for building purposes and find that they're unable to meet specific requirements.

"As people find their flood insurance rates increasing, which it would if their homes or property settle below the flood elevation, they'll look for solutions at city hall," Miers added.

Following the release of FEMA's 2007 preliminary flood hazard map for Lafayette Parish, Fenstermaker & Associates was contracted by LCG to survey nine different areas as part of an appeals process for some that had been designated as flood zones.

FEMA mapped all of the state's parishes and released them at different times. A new Lafayette Parish map is expected by the end of July. It too will be considered preliminary.

Bill Fenstermaker, CEO of the company, said he knew of no place in the city that was sinking, and he didn't believe it was anything to worry about.

But, as Ray Reaux, vice president of engineering services, pointed out, looking for subsidence was not in the scope of its work for LCG.

Meanwhile, it's hoped that changes in the new version of the map will more accurately reflect the elevations of an area containing several square miles in the southwest part of the city surrounding the Old Town Mill Creek subdivision, Fenstermaker said.

"It's hoped that it might take that out of the floodway, but there's no certainty at this point," he said.

An area along I-10 and Louisiana Avenue where the Dan Debaillon Coulee flows into the Vermilion River in the northeast part of the city was designated as a floodway, and it was also appealed.

"Based on our analysis, they needed to broaden the scope of the property that was mapped to determine whether it is in a floodway," Fenstermaker said.

"The problem with this is that it's not black and white," he said. "It's a mathematical formula or calculation and it's open to interpretation."

According to Roy Dokka, Ph.D., an environmental engineer with LSU, there were "generic problems" with all of FEMA's flood maps for Louisiana.

"Lafayette is a very progressive community," he said. "They're watching out and they put together the resources to challenge FEMA. There are places in Louisiana that do not have the resources to do that, and they have to take whatever FEMA gives them.

"So people wind up paying more for flood insurance than they need to, or they are unprotected."

(Connie Lewis / The News-Star (Monroe, La.), June 29, 2011)



## Unsafe dams can kill

**More than 4,000 of the 80,000 dams in the U.S. are at risk of "imminent failure," says the Association of State Dam Safety Officials. The American Society of Civil Engineers gives the country's dams a grade of D for poor maintenance. "Will it take the catastrophic collapse of a dam—like the five in the 1970s in the U.S. that killed hundreds—before the infrastructure is repaired?"**

As the U.S. and China endure record-breaking floods this spring, there is a risk that is being overlooked amidst the inundated towns, evacuations and rising waters. Dams in the U.S. boast an average age of 50 years, and the American Society of Civil Engineers continues to give the nation's dams a D grade overall in terms of maintenance. Will it take the catastrophic collapse of a dam—like the five in the 1970s in the U.S. that killed hundreds—before the infrastructure is repaired?

The nation's more than 80,000 dams have served us well—restraining less-than-epic floods and generating billions of kilowatt-hours of electricity for regional grids. In fact, massive dams across the western U.S., like Grand Coulee in Washington state, still provide the vast majority of "renewable" electricity in the U.S., some 7 percent. At the same time, hydropower can help balance more intermittent renewable resources, such as wind power. For example, water can be held back water to cope with "wind droughts," prolonged periods of little or no wind such as an 11 day wind drought in the Pacific Northwest earlier this year.

But these dams of legend—that helped win World War II as the poster illustrating this post implies—are old. And old dams are in danger of failure—more than 4,000 in the U.S. alone are at high risk of imminent failure, according to the Association of State Dam Safety Officials.

*Editor's note: The original broadcast incorrectly implied that the annual U.S. military budget is \$60 billion. The actual figure is closer to \$685 billion.*

On a per kilowatt-hour basis, dams are the most dangerous source of electricity generation, followed by burning coal with its attendant mining accidents and deaths via heavily polluted air. A tsunami flood crippled Fukushima Daiichi in Japan—prompting the meltdown of three nuclear reactors that have, so far, killed no one. A series of dam failures in China in the 1970s killed more than 200,000 people. Similarly, more than 500,000 have been evacuated in central and southern China this month due to flooding and mudslides, whereas about 80,000 have been relocated due to the nuclear plant disaster in Japan.

In fact, the filling the reservoirs behind new big dams in China may have helped trigger the deadly 2008 earthquake in Sichuan Province. As a result, the Chinese government has admitted that its most massive dam—Three Gorges—has "urgent problems," ranging from "geological disaster prevention" to the ongoing relocation of millions of people.

Nevertheless, the world is embarking on a new renaissance of big dam building; just this month Brazil gave final approval to move forward with the massive Belo Monte dam in the Amazon region of Para state on the Xingu River,

which will be able to produce more than 11 gigawatts of power. Meanwhile, the world's older dams are in dire need of refurbishment, lest the floods burst their bounds.

<http://bcove.me/pcoxna7k>

(David Biello / ScientificAmerican.com, Jun 20, 2011)

## ENGINEERING GREENER CONSTRUCTION California roads paved with RAC provide promising green results

About 11 million tires end up in U.S. landfills each year, and research by the California Department of Resources Recycling and Recovery shows that rubberized asphalt concrete and tire-derived aggregate made from these tires could reduce landfill needs. RAC uses 2,000 tires for each paved mile. Results show these roads provide increased traction, need less maintenance and reduce noise by up to 85%.

Recycled tires offer a green and cost-effective solution in some construction applications.

The California Department of Resources Recycling and Recovery (CalRecycle) promotes the use of tire-derived products to help reduce the nearly 11 million tires that end up in landfills each year. Throughout the years, CalRecycle has investigated a variety of scrap tire diversion alternatives through its research and market development efforts, and to date projects involving rubberized asphalt concrete (RAC), civil engineering uses, energy recovery, molded rubber products and other tire-derived product applications have been explored. Of these applications, RAC and tire-derived aggregate (TDA) used in civil engineering projects have shown the greatest promise for diverting a significant portion of tires.

### WHERE THE RUBBER MEETS THE ROAD

RAC has been used in California for 30 years and is the largest recycled tire application in the state today. Composed of ground tire rubber that is mixed with asphalt and other aggregates, RAC puts 2,000 tires to new use with every paved lane mile. Roads paved with RAC last longer, need fewer repairs, provide better traction and reduce noise by up to 85 percent. CalRecycle's RAC grant program helps cities and counties pave streets with RAC and provides technical assistance to communities interested in using RAC.

While RAC is widely used, and RAC grants have been available for several years, CalRecycle is branching out to promote TDA as an equally beneficial and cost-effective recycled tire product.

### A PRIZED LIGHTWEIGHT

TDA is made from shredded tires and can be used for slope stabilization, retaining wall backfill, lightweight embankment fill, vibration mitigation, various landfill applications and more. TDA constitutes the second largest re-use market for scrap tires in California. To promote its use in state highway projects, CalRecycle has partnered with the California Department of Transportation (Caltrans).

Caltrans completed its first TDA project in August 2009 to repair portions of U.S. 101 at Confusion Hill in Mendocino County that were damaged by rockslides and road surface slip-outs. These problems became more frequent as years passed, requiring constant and costly maintenance. Caltrans chose to reroute U.S. 101 to avoid the rock slide area and its related problems.

The proposed route required two new bridges, but the embankment for one bridge had an existing underground drainage structure that could not handle the additional load. Project engineers determined that a lightweight fill material would prevent possible damage to the subsurface

drainage. TDA was chosen because of its lightweight properties and cost-effectiveness. The project used approximately 270,000 scrap tires and saved Caltrans an estimated \$320,000. Based on the success of this project, Caltrans has accepted TDA as a viable lightweight construction material.

CalRecycle also has partnered with local governments using TDA on landslide highway repair projects in Mendocino, Sonoma and Santa Barbara counties.

### A STABILIZING FORCE

Portions of Marina Drive in Mendocino County were constructed on steep terrain vulnerable to landslides, especially during heavy rain. In 2006, saturating rains triggered a landslide that damaged Marina Drive for the fourth time in less than 10 years. As in the past, the road surface slipped a few feet. In the interest of minimizing road closures, county crews would normally add more pavement to make the slipped section even with the original road surface. This proved to exacerbate the problem by adding more weight to the repaired section, making it more likely to slip again in the future. With the latest damage, it became apparent a new, longer lasting repair was necessary.

The traditional technique of repairing a landslide or "slip out" requires excavating unstable material to reach more stable soil, then rebuilding the slope in lifts (compacted layers of soil). Drainage networks are typically added so hydrostatic pressure does not build up behind the fill after rain storms, causing potential instability. With TDA, less excavation is required to achieve the appropriate factor of safety since TDA is much lighter than soil. TDA also is free draining, which means water flows through the backfill material instead of saturating the soil, resulting in a more stable road section. This new design technique resulted in a more cost-effective and permanent way to repair roads that fail because of landslides.

Using TDA to repair Marina Drive saved Mendocino County \$740,000 and put 133,000 scrap tires to use.

### A DAMPENING EFFECT

CalRecycle also promotes use of TDA in other applications. In 1999, the department commissioned the first field test of TDA as a vibration dampening material under light rail tracks. The result of that test led to the recommendation that the Valley Transit Authority (VTA) use TDA for its Vasona Line light rail extension in Santa Clara County.

VTA built a test section in its San Jose rail yard in 2001 to examine the vibration-dampening effect of TDA. CalRecycle supplied the TDA and monitored construction and testing of this pilot project.

Tests confirmed that the use of a one-foot-thick layer of tire shreds located beneath the sub-ballast, ballast layers and ties of the light rail track section was an effective vibration mitigation measure. Based on these findings, VTA chose to construct four sections of track, more than one-half-mile in length, with the new TDA vibration mitigation underlayment during construction of the Vasona Line extension, which was completed in 2005. An analysis conducted in 2009 showed the sections of track with TDA were still mitigating vibration effectively after four years of operation.

Using TDA along part of the Vasona Line extension diverted 100,000 scrap tires from California landfills and resulted in a savings of \$1 million. In a related project, the Bay Area Rapid Transit system will use TDA as a vibration dampening measure as it expands from Fremont toward San Jose over the next seven years, diverting at least 250,000 tires from landfills.



With the experience gained from these successful state and local partnerships, CalRecycle now considers TDA a truly green solution: a cost-effective, reliable alternative to traditional fill materials such as gravel or soil.

More information about TDA use in civil engineering projects is available from the Green Roads website at [www.pavinggreenroads.com](http://www.pavinggreenroads.com). CalRecycle is presenting a series of free workshops in April and May 2011 to provide TDA technical information and assistance. Registration information is available by visiting the Green Roads website and clicking on the "Events Calendar" link.

(Recycling Today, 4<sup>th</sup> May 2011 - This article was submitted on behalf of the California Department of Resources Recycling and Recovery, [www.calrecycle.ca.gov](http://www.calrecycle.ca.gov)).



### Engineering students build bricks with recycled glass

Two engineering graduate students at the University of Washington have discovered that recycled glass can be used to make bricks. Renuka Prabhakar and Grant Marchelli, who named their invention VitroBricks, said the production of glass-made bricks requires 80% less fuel as it depends on a shorter period of heating at a lower temperature than clay bricks. Prabhakar and Marchelli said bricks made from recycled glass are lighter, more durable and provide better insulation than typical building bricks.



We may need to ditch that aphorism about throwing stones at glass houses.

Two engineering graduate students at the University of Washington have found a way to make bricks out of recycled glass that they say are stronger, lighter and better insulators than conventional building blocks.

Renuka Prabhakar and Grant Marchelli claim their VitroBricks require 80 percent less energy to produce because they're fired at a much lower temperature for a shorter time. Most promising of all, according to the engineers, their invention can put to work the millions of tons of discarded glass that end up in landfills each year.

Sound too good to be true? It's still an early-stage technology, and Prabhakar and Marchelli need to prove they can manufacture consistently and cheaply enough to break into the masonry industry.

But the students' startup, EnVitrum (Latin for "out of glass"), has already drawn interest from UW research funders, brick makers and architects like Perkins+Will. Waste

Management says it'll pay them to take mixed-color waste glass off its hands.

Prabhakar and Marchelli say they were inspired by the surprisingly low level of glass recycling: Only 26 percent of the glass waste stream is actually reused, according to the United States Environmental Protection Agency. Bottle makers can use only 10 percent to 35 percent recycled material and any impurity, including mixed colors, can render their products useless.

The grad students first tried using finely crushed glass for 3D printing – essentially stacking thin layers of glass– but found that the results resembled a Jell-O salad more than a brick. Then they experimented with sintering, a technique for fusing powdered materials. Prabhakar and Marchelli mixed in a binding agent they developed (they will say only that it's not toxic or petroleum-based) and created a process for heating the bricks at multiple temperatures.

"It's not as simple as making a brick and putting it in the oven," says Prabhakar.

The resulting product, though, has the heft and gritty texture of a clay brick. A glass brick can be designed to be highly porous, drawing water through capillary action. In hot climates, running water through a wall would produce evaporation, cooling a building.

The glass bricks' unique porosity may also be useful for so-called living walls. The two engineers have developed prototypes with special cavities for plants, since many living walls so far have relied on felt or plastic containers with limited durability.

Gregg Borchelt, president of the Brick Industry Association, says plenty of would-be inventors try alternative materials for brick before running into, well, a brick wall when it comes to cost or durability.

He says cheap waste glass and lower energy costs for firing could be advantages for Prabhakar and Marchelli – if they can show their products are reliable and they can obtain a lot of glass.

"A typical plant will turn out 40 million bricks per year, so that's a pretty big pile of material," notes Borchelt.

The next hurdles for Prabhakar and Marchelli are verifying their bricks can meet international standards for building materials and gaining independent verification of their manufacturing process. They hope to license the technology rather than go into the brick-making business themselves.

"We don't really want to be masonry manufacturers," says Prabhakar. "We're both engineers and that's what we love to do. We want to develop and scale and be problem-solvers."

(Jonathan Hiskes / Sustainable Industries, May 5, 2011)

## Η ΔΙΚΗ ΤΟΥ ΣΩΚΡΑΤΗ !!!

Ο Σωκράτης κατά γενική ομολογία, θεωρείται ο πατέρας της σύγχρονης δυτικής σκέψης. Η δίκη και καταδίκη του σε θάνατο, από πολλούς ερμηνεύεται ως αποτυχία του δημοκρατικού πολιτεύματος. Ορισμένες νέες ακαδημαϊκές απόψεις, πάντως, προτάσσουν ότι η δίκη του Σωκράτη ήταν απολύτως νόμιμη αλλά και ότι ο ίδιος ο Σωκράτης ήταν αυτός που προκάλεσε το θάνατό του.

2.410 χρόνια μετά ξαναέγινε η δίκη του Σωκράτη, αλλά όχι στην Αθήνα !!!

Με πρωτοβουλία του Ιδρύματος Ωνάση και με τη συμμετοχή κορυφαίων δικαστών και δικηγόρων διεξήχθη με όλους τους δικονομικούς κανόνες, σε Ομοσπονδιακό Δικαστήριο της Νέας Υόρκης !!!!

Στη δίκη του Μανχάταν, η οποία ουσιαστικά δεν αποτελούσε αναπαράσταση, αλλά μια νέα εκδοχή, εξετάστηκαν όλες οι κατηγορίες που βάρυναν το Σωκράτη το 399 π. χ., με σκοπό να αποφανθούν οι Αθηναίοι αν είναι «ένοχος» ή «αθώος», κατηγορούμενος για «ασέβεια προς τους Θεούς» και για «διαφθορά των νέων».

Στην ιστορική αυτή δίκη, με αρχαιοελληνικά στοιχεία και συνάμα με σύγχρονες αντιλήψεις, δοσμένες με νομικές εκφάνσεις και χιούμορ, όπου εκατοντάδες θεατές είχαν την ευκαιρία να βιώσουν μια εκπληκτική «παράσταση» της αλήθειας, του νόμου και της ελληνικής κληρονομιάς, ο Σωκράτης αθωώθηκε τελικά με ψήφους δύο προς μία !!!

Οι τρεις δικαστές ήταν ο Ντένις Τζέικομπς (πρόεδρος του δευτέρου ομοσπονδιακού εφετείου ΗΠΑ), ο οποίος προήδρευσε, η Λορέτα Πρέσκα (πρόεδρος ομοσπονδιακού δικαστηρίου της νότιας περιφέρειας Νέας Υόρκης) και η Κάρολ Μπέγκλεϊ Έιμον (πρόεδρος ομοσπονδιακού δικαστηρίου της ανατολικής περιφέρειας Νέας Υόρκης). Οι δυο πρώτοι ψήφισαν υπέρ της αθώωσης του Σωκράτη και η τρίτη τον καταδίκασε. Δημόσιοι κατήγοροι, εκπροσωπώντας την Πόλη των Αθηνών, ήταν ο δικηγόρος, οικονομολόγος και πρόεδρος του Ιδρύματος Αλέξανδρος Ωνάση, Αντώνης Παπαδημητρίου και ο έφεδρος συνταγματάρχης και νυν αναπληρωτής εισαγγελέας στη Νέα Υόρκη, Μάθιου Μπογδάνος. Συνήγορος υπεράσπισης ήταν ο Έντι Χέις και την Απολογία του Σωκράτη έκανε ο Μπενζαμίν Μπράφμαν, διακεκριμένοι ποινικολόγοι.

Δυστυχώς για μια άλλη φορά, η ιστορία αυτή ήρθε στο φως της δημοσιότητας από τα Ελληνικά ΜΜΕ, όχι γιατί ήταν σημαντική για τον Ελληνικό Πολιτισμό και Κληρονομιά, αλλά γιατί αυτός που υποδύθηκε τον Σωκράτη, είναι ο Μπενζαμίν Μπράφμαν . . . . Ο Μπέντζαμιν Μπράφμαν θεωρείται ένας από τους κορυφαίους ποινικολόγους της Αμερικής και όπως όλοι (μάλλον) γνωρίζετε προχθες εμφανίστηκε σε δικαστήριο στο Μανχάταν μαζί με τον Ντομινίκ Στρος-Καν, υποστηρίζοντας ότι ο πελάτης του «είναι αθώος». Πρόκειται για τον ίδιο δικηγόρο που υπερασπίστηκε τον τραγουδιστή Μάικλ Τζάκσον και αλλά γνωστά ονόματα της πολιτικής και του θεάματος.

Τι να πεί κανείς ???

Να θαυμάσει την προβολή του αξιόλογου αυτού θέματος από τα Μέσα ή να απογοητευθεί με το timing !!!!

Αξίζει να διαβάσετε περισσότερες λεπτομέρειες για το θέμα, στις ακόλουθες ιστοσελίδες:

# ΕΝΔΙΑΦΕΡΟΝΤΑ - ΣΕΙΣΜΟΙ

## Why One Remained Standing

Architecture rarely goes viral on the Internet, but a video of Toyo Ito's Mediatheque in Sendai taken at the height of the Japanese earthquake has had an extraordinary run as an eyewitness and vertigo-inducing account of what it was like to be inside a building during the magnitude-9.0 earthquake that struck Japan on March 11. ([www.youtube.com/watch?v=heh5ITmYbRs](http://www.youtube.com/watch?v=heh5ITmYbRs))



A photograph of the Mediatheque (Toyo Ito & Associates)

The video was shot by someone who had taken refuge under one of the tables in the audio-visual library on the seventh floor. The building shook and swayed violently; everything cascaded from shelves and desks onto the floor. Ceiling panels appeared to swing drunkenly overhead. But the Mediatheque did not collapse. It stood firm against the massive seismic forces that were tearing other buildings apart; the basic structure did not fail.

Mr. Ito is one of Japan's, and the world's, best-known architects, and the Mediatheque has been celebrated internationally for its visual elegance and radical structural solution. Completed in 2001, it was the winning design in a competition for an interactive multimedia center with a wide range of cultural activities, from the visual and performing arts to computers with free Internet access. It soon became a cool place to hang out. My own memory of its serene and inviting presence on a leafy, tree-lined avenue is irreconcilable with the images of devastation that have filled the media.

But a glass-walled box that emphasizes lightness and transparency—there are seven open floors with almost everything visible from the street—does not suggest invulnerability to an epic natural disaster. This is the kind of architecture that critics of modernism like to call risky and unreliable. When flaws appear, *schadenfreude* follows.

It would be easy to call the Mediatheque's survival a miracle, but it would be wrong. The building's extraordinary resilience was the result of a close collaboration between a creative architect and an equally creative engineer, Mutsuro Sasaki, known for his ability to devise innovative systems that turn provocative designs into safe buildings without sacrificing their original vision. Both Mr. Ito and Mr. Sasaki were mindful of lessons learned from the Kobe earthquake of 1995 that took place during the design process. Together, they went beyond Japan's strict earth-

quake codes for a new aesthetic and structural model.

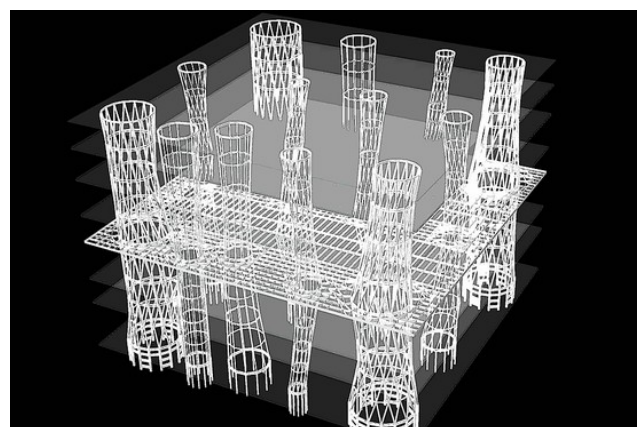
This brings another legendary earthquake survivor to mind—Frank Lloyd Wright's Imperial Hotel in Tokyo, one of the few structures left standing after the great Kanto earthquake of 1923. Separated by almost a century and a revolution in technology from Mr. Ito's Mediatheque, Wright's building was equally radical in its pursuit of stylistic and engineering advances in its day. But a lot has changed since 1923. Communications and construction have been totally transformed, and so have life and the world. Only the destructive forces of nature remain the same.

Wright spent many seasick weeks crossing and recrossing the Pacific; today's architects jet through time zones. Computers deliver designs and specifications and assist in their execution on a global scale. It took several days for Wright to receive the news in the famously worded telegram from his client and patron, Baron Okura, that the "building stands undamaged as monument to your genius"—something Wright would have been the last to deny. The Internet gave us instant, live images of how Mr. Ito's building performed under stress.

Wright's Imperial Hotel was a massive, elaborate cave of brick and local Oya stone with a romantic overlay of exotic detail. Its modernism derived from his tradition-shattering Prairie Houses and an idiosyncratic personal style. The hotel was erected on bamboo scaffolding using centuries-old methods of painstaking hand labor.

But Wright's building endured, and that, too, was no accident. What Wright and Mr. Ito had in common was their reliance on the essential teamwork of architect and engineer. Wright had counted on more than his customary hubris when he promised the Japanese an earthquake-proof structure; he brought his own engineer, Paul Mueller, from Chicago to do the job.

Wright and Mueller were familiar with the "floating" foundations developed in Chicago as the new tall buildings rose on unstable, muddy soil. The Imperial Hotel was divided into independent sections attached individually to a floating base meant to move with the shocks; this flexible foundation absorbed the seismic forces that would make a more rigid building collapse. The Imperial Hotel was finally demolished—not by nature, but by man—in 1968, its entrance and lobby re-erected in an outdoor museum of the Meiji period.



A computer rendering of the Mediatheque's lattice columns

Mr. Ito's minimalist aesthetic, with its emphasis on lightness, fluidity and transparency, would have been unthinkable and impossible at that early date; the materials and technologies of modernism were being developed in more industrialized countries. Today Japan is on the cutting edge in the design and digital worlds. But as Mr. Sasaki

wrote in a Harvard Graduate School of Design publication in 2002, "no building has pushed architectural or structural thought further than the Sendai Mediatheque."

The architect's challenge to the engineer can be formidable. Mr. Sasaki describes how the process began with a single sketch sent by Mr. Ito from an airport, "expressing a virtual world of indeterminate, seaweed-like tubes swaying freely as they supported floor plates, as though the architecture were without weight or dimension." The image was "poetic but far from any known reality."

So how does an engineer get from poetic floating seaweed to a building that can withstand a magnitude-9.0 earthquake? How does he deal with "the vision of an architecture without weight or thickness," something so without precedent that it requires an equally unprecedented structural resolution?

Mr. Sasaki began by breaking the sketch down into its structural parts—floor, beam, column and foundation. Mr. Ito's slender floor slabs were impossible to achieve in concrete without the conventional support of beams or walls; they would have been far too heavy and deep. Instead, Mr. Sasaki used a steel "sandwich" strengthened internally by a network of steel ribs for a slender floor plate only 15¾ inches thick. The welding technique was borrowed from shipyard building.

The stacked floor plates of a multistory building are customarily carried on solid columns. The objective here was to make the columns as light and transparent as possible. Mr. Sasaki substituted a system of hollow steel tubes in the form of open, spiraling lattices formed by smaller steel tubes. There are 13 of these lattice tubes, but only the four largest, 20 to 30 feet in diameter, placed at the corners of the floors, support the building's main loads.

The nine smaller tubes vary in size and diameter and are placed randomly throughout the building, some straight, some angled, echoing the idea of Mr. Ito's "floating seaweed." These twisted, canted, open supports have a structural strength and rigidity that increases the building's earthquake resistance. They act as light wells and contain elevators, stairs and conduits for utilities.

At the basement level, the columns are solid and firmly fastened to a below-ground framework connected by beams that can bend and deform without breaking. The large corner columns that channel the building's major forces to the ground also conduct the seismic energy to this framework, where 60% to 70% of it is absorbed, reducing the stresses to the building above. An engineering inspection after the earthquake determined that Mr. Sasaki's system worked.

Fortunately, the tsunami did not reach the building, and the damage was limited to broken glass on the first and third floors, part of a window on the double-glazed south side, a section of ceiling that had fallen on the top floor, solar equipment, and a rooftop air duct. Repairs are under way, and the Mediatheque has announced that it will reopen up to the fourth floor this month, with the fifth and sixth floors scheduled to open in early June.

It is the structural engineer's rationalism and expertise that translates the architect's intent into the building's final form; he carries the awesome responsibility for its safety and stability in normal and extreme conditions. But the creative relationship between the two, and the complexity and sensitivity of the process, are rarely acknowledged. "The best resolution of art and technique," as Mr. Sasaki sees it, "occurs the moment that structure vanishes as a separate entity and is visually fused with the

architectural design." It takes two to tango, to bring vision to reality, to turn a building into art.

(Ada Louise Huxtable / The Wall Street Journal Tuesday, May 10, 2011)



### Lessons in engineering from the tsunami in Japan

Engineers and emergency planners from northern California to British Columbia say the massive undersea quake and tsunami that recently assaulted Japan gives clear warning about the danger that lurks just off the Pacific coast like a mad dog sleeping by the bed: A 630-mile-long geologic feature that was identified in 1984 is believed to be very similar to the one that broke with such violence off the coast of Japan in March.

Evidence of violent breaks in the feature—called the Cascadia Subduction Zone, or CSZ—has been found in sediment layers left by prehistoric tsunami. On April 25, 1992, a 7.2-Mw earthquake with an epicenter at the south end of the CSZ in northern California produced a modest tsunami that struck shore. That event confirmed the zone's potential to produce not only strong earthquakes but locally sourced tsunamis that could be ashore within as few as 10 minutes.

"The 1992 quake finally got everybody onboard," says Lori Dengler, a geology professor at Humboldt State University in northern California. "Before then, it was all paleo-tsunami evidence. We were fortunate that our real live earthquake was not a 9 but a 7.2."

Alarmed, Congress in 1995 directed the National Oceanic and Atmospheric Administration to form a federal and state working group called the National Tsunami Mitigation Program. Much of its energy comes from officials in Alaska, Hawaii and the Pacific Northwest.

Based on fast-changing science, inundation zones have been modeled, maps drawn and revised, and warning systems deployed. "FEMA P646: Guidelines for Design of Structures for Vertical Evacuation From Tsunamis" was published in 2008 to help planners find ways to move people to safety within minutes.

A few West Coast vertical evacuation facilities are in conceptual design, but uncertainty persists about how to evaluate the risk or engineer for tsunami loads. Knowledge about the dangers continues to evolve.

"We had been helping prepare for Cascadia for about 15 years," says Jay Raskin, president of Ecola Architects PC, Cannon Beach, Ore. As a Cannon Beach councilman and, for a time, mayor, Raskin advanced plans for a new city hall strong enough and tall enough not only to withstand a 9.0 quake but to provide shelter from tsunamis on its upper floor and roof—for a few hours, at least—to the resident population of 1,700. The problem of a possible additional 15,000 visitors who could be there on a summer day is not addressed by the plan.

"We always thought getting to high ground was enough—and we have a lot of high ground around here," Raskin says. But each new tsunami in the world generates new insights, leads to improved modeling and data, and usually ratchets up the appreciated risk. The March 11 quake off the Tohoku region of the northeast coast of Honshu Island, Japan, is no exception. There is a greater respect for what is unknown about subduction-zone behavior, experts say.



Geologists, engineers and policymakers were caught off guard by the power of the Tohoku event. They believed the geology that launched it could produce an 8.2-Mw quake—but not a 9—and defenses were scaled accordingly, Dengler says. The March 11 event is a reminder of how scant the historic record is on subduction zones, she says. The Tohoku quake itself could be considered unusual—except there is so little data to say what “unusual” really is, she says.

Dengler says the Dec. 26, 2004, Indian Ocean quake was the greatest and longest subduction-zone rupture in recorded history—1,400 kilometers long with 20 meters of slip. By contrast, she says, models of the Tohoku quake suggest the slip was in a “patch” 100 km long by 300 to 400 km wide; the shift was 50 meters. “If I were at the tip of the plate, in a minute or two I would find myself 150 feet to the east. That’s an unbelievably huge slip,” she says.

Even though Japan invests a greater part of its gross domestic product in tsunami defenses than any other country in the world, Dengler says experts on that coast had not prepared for an event of that magnitude, which had a wave run-up as high as 128 ft.

“The No. 1 failing in Japan was that they underestimated their hazard,” says Dengler, who just returned from a 10-day examination of the tsunami wasteland. “When you underestimate the hazard, everything else fails—the engineering, the education, the policies, the response ... they fell so short. It’s discouraging.” She says her team is reexamining everything now in light of lessons from Japan.

Yumei Wang, a geotechnical engineer focused on risk management and the geo-hazard section leader at the Oregon’s Dept. of Geology and Mineral Industries, (DOGAMI), is at the forefront of efforts to protect people in Oregon’s tsunami zone. She says the Tohoku quake is “a brutal reminder that we are not doing nearly enough.”

Wang says the southern half of Oregon’s 300-mile coastline has high ground that can provide refuge for coastal residents. However, her biggest concern is the central and north coast, a lower area with extensive flatlands. “I’ve identified 12 communities that should be considering vertical evacuation,” Wang says. “They are so far from being ready.”

Just as in Japan, officials here on the West Coast warn that the only reliable way to escape a tsunami is to go to high ground on foot. Cars get stuck in traffic. Roads rarely take the shortest route uphill. In the case of the Pacific Northwest, where the CSZ is so near the shore, a tsunami could be on the beach in less than 20 minutes in most places.

Inundation maps throughout the CSZ coast are progressively being refined. Most now are based on modeling of dozens of runs of both distant-source and near-source tsunamis, with partial slips or complete slips along the entire length of the CSZ. Models project across the local bathymetry and topography. Predicted heights vary by location.

Raskin says the design tsunami for Cannon Beach is based on a DOGAMI study; the state has 95% confidence that it covers all possible tsunami events. “The decision to keep with the 95% confidence level was based primarily on the fact that the worst-case scenario is a one-in-10,000-year event,” Raskin says. The inundation for that 100% solution is 25 ft higher.

The conceptual plan for a new city hall calls for an elevated, 10,000-sq-ft building with deep concrete piles laterally braced by post-tensioned grade beams, with a post-tensioned municipal office floor and rooftop terrace. Three sets of external stairs lead to the main floor, which is 15 ft above grade, including one that is obviously a grand stairway to safety.

## No Visible Damage

Raskin says Kent Yu, a seismic engineer in Portland and principal with San Francisco-based Degenkolb Engineers, is working on the city-hall project. He says Yu recommended, based on his observations in quake-disaster zones around the world, the building be engineered to withstand extreme seismic loading without showing damage, Raskin says. Frequently, people will not reoccupy buildings after a quake if they see damage, even if the building is declared safe. “If we only have 20 minutes to get people in, there should be no hesitation at all,” Raskin says.



Waves come ashore in Japan’s Fukushima Prefecture on March 11, 2011.

The building may cost about \$4 million—twice the cost of a conventional solution, Raskin says. Hopes for a congressional appropriation are dead for now, but the town is applying to get funding as a disaster mitigation project through FEMA. Raskin believes mitigation funding would be a good solution and set a precedent that could benefit towns all along the coast.

Meanwhile, Yu has been hired to do a comprehensive study of Cannon Beach’s resilience to disasters. “I was asked to look at the effect of the earthquake and/or tsunami on their community and to look at government resilience, because we don’t want to become another Haiti, incapacitated by disaster,” he says.



Tsunami swells race to shore at Natori City, Japan, ramping up and breaking, the wind of their forward speed flinging up spray. The successive waves compound the depth and velocity over land. Water raced across flat ground as far as 6 km inland.





"We need to look at the bridges, wastewater, hospitals and schools and get a general idea of what's going to happen," Yu says, referring to a major seismic and tsunami event as an inevitability, as many planning officials in the region now do. "We need to look at it from an economic perspective: What will be the effects of a disaster on recovery? Also, we need to look at the civic infrastructure—the social networks, the non-governmental, community-based and faith-based organizations. These organizations provide very critical services to the community."

Yu admits that such a study may seem a broad portfolio for a structural engineer, but he says, as a member of a state seismic safety policy advisory commission, he is interested in promoting a safety policy to make the state more resilient to seismic events. He says, "When I do engineering projects, I can only solve one thing at a time. When I look at the policy level, I can bring more impact to society."

#### **Deadly Case Studies**

An estimated 1,300 people are dead or missing in Onagawa, Japan, a town of 10,000 in a narrow valley north of Sendai. A tourism center at the harbor's edge survived with heavy damage from the earthquake, fire and tsunami. An observation platform on top was the only part above the sea.

See the following six images for details.



#### **Deadly Case Study 1: Stripped and Bent**

A steel-frame building that yielded but did not fail will give up load data through analysis of its deformation.



#### **Deadly Case Study 2: Rolled**

Six substantial buildings were torn from their foundations and rolled over by rushing water. In all cases, weak connections to piles (next image) appear to be a factor.



#### **Deadly Case Study 2: Weak Connections**

Weak connections to piles appear to be a factor.





#### Deadly Case Study 3: Survivors

A few reinforced-concrete structures still stand, although gutted by the force of the waters. This one may have been shielded by other structures as well.



#### Deadly Case Study 4: Stranded

"All buildings have debris on their roofs if they are less than 70 feet tall," says an ASCE investigator. "Cars float quite easily."

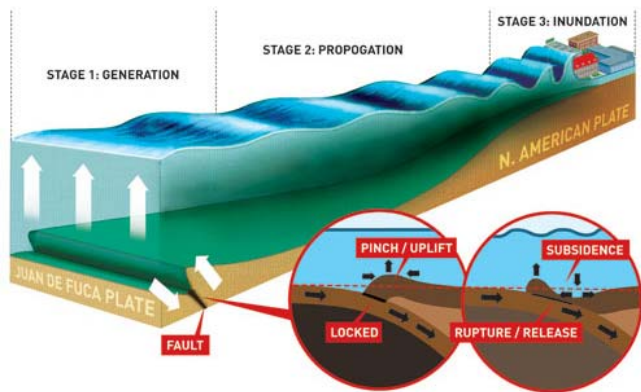


#### Deadly Case Study 5: Lateral Truss

Heavy bracing revealed at the rooftop level is credited with helping the town's waterfront tourism center survive, although with extensive damage.



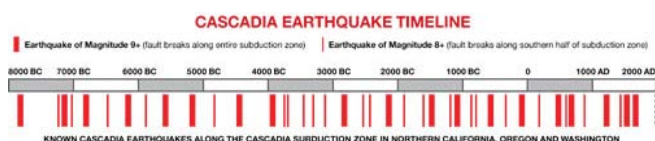
**Potential Rupture:** Emergency planners talk about when the CSZ ruptures, not if. Chris Goldfinger, an Oregon State University, Corvallis, marine geologist who studies core samples, believes the probability of an 8.0-magnitude quake or greater within 50 years—at least in the southern portion—is 37%.



**Cascadia Subduction Zone:** Geologists recognized a 630-mile-long subduction zone off the U.S. northwest coast only in 1984. Its potential to generate 9.0 or greater earthquakes and near-shore tsunamis has been confirmed by paleoseismologists coring for sedimentary evidence of pre-historic events. In 1992, a 7.2-Mw quake at the south end brought the message home.



**Walking Circles.** Timothy J. Walsh, chief hazards geologist at the Washington state Dept. of Natural Resources, is particularly worried about the lack of viable escape for residents of two low-lying peninsulas. At Ocean Shores, residents helped chart two-minute walking circles for fast and slow walkers to help select potential sites for vertical evacuation facilities. One preference is for artificial berms linked by a hiking trail. Summer tourists can swell the population of about 5,000 to 100,000.



Time line of known cascadia earthquake along the Cascadia Subduction Zone in Northern California, Oregon and Washington.

(Tom Sawyer / Engineering News-Record, 05/18/2011)



## Japan's Tsunami Debris Offers Wealth of Data

"Engineers should become more involved in research and fundamental knowledge," says Ian Robertson, a professor of civil engineering at the University of Hawaii at Manoa. In April, he was on the first of seven teams sent by the American Society of Civil Engineers to Japan to analyze the March 11 quake and tsunami. "There is a tendency to just do what's in the code," says Robertson, "but in this case the code has been idling. It's time to bring it up to speed."



The row of bent flagpoles in Sendai (above) and pressure-shattered walls of a building in Natori City (below) will help establish load baselines for analysis.



The tsunami team, under leader Gary Chock, president of Martin & Chock Inc., Honolulu, followed up on aerial photos and videos to examine structures that survived. The team took photographs, measurements and rebar and concrete samples for analysis. The data will be used to validate water height, velocity, momentum over land and the impact-force of water and debris.



Validating formulas for calculating impact loads of water-borne debris is of particular interest. Debris loads are a source of tremendous damage but are difficult to test. Calculations also are complicated by the damming effect of the striking objects. The force of the water driving forward adds to the momentum of the debris. Some of the damage is expected to provide clear examples of the pure force of the water pressure and velocity, while other examples likely will generate a new appreciation of the need to consider not only onrushing waves, but the force of the returning seas as well.

(Tom Sawyer / Engineering News-Record, May 18, 2011)



### Millions 'at risk from earthquakes'

Millions of people in Europe, the Middle East and Asia are at risk from deadly tremors which can strike out of the blue in unmapped earthquake zones, scientists have warned.

Attention should be focused on these regions, which lie within the interior of continents, instead of well known earthquake "hotspots", according to two leading experts.

They stress that "interior zone" earthquakes kill far more people than those in recognised danger areas on continental edges such as Japan and California.

Over the past century, earthquakes on large fault lines where shifting plates of the Earth's crust collide and slip have claimed around 800,000 lives, say the experts writing in the journal Nature Geoscience. Around half these deaths were due to tsunamis like the one which struck the north-east coast of Japan in March.

In contrast, sudden earthquakes in continental interiors within the plates killed around 1.4 million. Interior quakes also killed far more people directly by shaking the ground and toppling buildings.

Professor Philip England, from Oxford University, and Professor James Jackson, from Cambridge University, classified 130 earthquakes occurring in the last 120 years.

The experts argue that more scientific resources should be directed at identifying seismic risk in regions such as the 10 million square kilometre Alpine-Himalayan belt, which covers Italy, Greece, Turkey, Iran and central Asia, and China.

The scientists wrote: "On the plate boundaries, the location of the hazard is well known and earthquake timing constitutes the greatest uncertainty.

"In many parts of the continental interiors, however, we do not even know where the hazards lie. Slavish application of a model based on plate boundaries around the Pacific rim to earthquake hazard in continental interiors is not merely unhelpful, but can be positively dangerous.

"We argue that the knowledge that underpins earthquake resilience in Japan or California must be transferred to countries in which earthquakes regularly inflict huge death tolls, often far from the media spotlight."

(New Civil Engineer, 24 May 2011)



### Άσκηση επί χάρτου για το τσουνάμι

Πραγματοποιήθηκε χθες στην αίθουσα Διαχείρισης Κρίσεων, της Αποκεντρωμένης Διοίκησης Κρήτης (πλατεία Κουντουριώτη, Ηράκλειο) άσκηση επί- Χάρτου στα πλαίσια του έργου "POSEIDON" το οποίο συγχρηματοδοτείται από την Ευρωπαϊκή Επιτροπή στα πλαίσια του Ευρωπαϊκού Μηχανισμού Πολιτικής Προστασίας.

Ο στόχος του έργου είναι να δοκιμάσει τις διαδικασίες ενεργοποίησης του Ευρωπαϊκού Μηχανισμού Πολιτικής Προστασίας στην περίπτωση μιας μείζονος κλίμακας φυσικής καταστροφής, τις διαδικασίες άμεσης ανταπόκρισης της Ε.Ε. καθώς και τις διαδικασίες επιχειρησιακής αξιοποίησης της Ευρωπαϊκής συνδρομής

Η άσκηση επί-Χάρτου γίνεται στα πλαίσια προετοιμασίας για την μεγάλη άσκηση επιχειρήσεων η οποία θα πραγματοποιηθεί 24-25 Οκτωβρίου στην Κρήτη με συμμετοχή παρατηρητών από 30 και πλέον χώρες που συμμετέχουν στον Ευρωπαϊκό Μηχανισμό Πολιτικής Προστασίας.

Συντονιστής του έργου POSEIDON είναι η Δ/ση Πολιτικής Προστασίας της Αποκεντρωμένης Διοίκησης Κρήτης, ενώ συμμετέχουν δύο Εθνικές Αρχές Πολιτικής Προστασίας της Ευρωπαϊκής Ένωσης: της Ελλάδας (Γενική Γραμματεία Πολιτικής Προστασίας, Υπουργείο Προστασίας του Πολίτη) και της Κύπρου (Πολιτική Άμυνα), δύο εθελοντικές οργανώσεις: Ο Ελληνικός Ερυθρός Σταυρός και Η πολιτική Προστασίας Χωρίς σύνορα της Γαλλίας, το Ίδρυμα Τεχνολογίας και Έρευνας, με το Ινστιτούτο Υπολογιστικών Μαθηματικών (ανάλυση επικινδυνότητας για τσουνάμι) και το Ινστιτούτο Πληροφορικής (καινοτόμες υπηρεσίες πληροφορικής και τηλεπικοινωνιών στην διαχείριση κρίσεων), καθώς και οι Τεχνολογίες Τηλεϊατρικής (Γαλλία) για την παροχή υποστηρικτικών δορυφορικών υπηρεσιών.

Στην άσκηση επί-Χάρτου έλαβαν μέρος ως ασκούμενοι-παίκτες εκπρόσωποι όλων των επιχειρησιακά εμπλεκόμενων στην διαχείριση συνεπειών από σεισμό και τσουνάμι, φορέων της Κρήτης (Κέντρο Επιχειρήσεων Πολιτικής Προστασίας, Κέντρο Διαχείρισης Κρίσεων Περιφέρειας Κρήτης, Περιφερειακή Διοίκηση Πυροσβεστικών Υπηρεσιών Κρήτης, 3η Ειδική Μονάδα Αντιμετώπισης Καταστροφών, Γενική Αστυνομική Διεύθυνση Κρήτης, Στρατιωτική Διοίκηση Κρήτης, Λιμενικό Σώμα – Κεντρικό Λιμεναρχείο Ηρακλείου & Χανίων, 7η Υγειονομική Περιφέρεια Κρήτης, Βενιζέλιο-Πανάνειο Νοσοκομείο Ηρακλείου, Εθνικό Κέντρο Άμεσης Βοήθειας – Κρήτης, Περιφέρεια Κρήτης, Περιφερειακές Ενότητες Χανίων και Ηρακλείου, Δήμοι Ηρακλείου και Χανίων, Ελληνικός Ερυθρός Σταυρός, Ραδιοερασιτέχνες Κρήτης, Εκπρόσωποι του Ιδρύματος Τεχνολογίας και Έρευνας). Στην άσκηση συμμετείχαν ως παρατηρητές Εκπρόσωποι Πολιτικής Προστασίας των Δήμου Ρεθύμνου, ΔΕΗ, ΟΤΕ, εκπρόσωπος του Γεωδυναμικού Ινστιτούτου – Εθνικού Κέντρου Προειδοποίησης για Τσουνάμι, όπως και εκπρόσωπος της Ευρωπαϊκής Επιτροπής.

Στην άσκηση επί-χάρτου προσομοιώθηκε για πρώτη φορά ο μεγάλος καταστρεπτικός σεισμός του 365μχ, στην δυτική Κρήτη ο οποίος είχε σαν συνέπεια μέχρι και την κατά 6-10 μέτρα ανύψωση περιοχών στα δυτικά παράλια της Κρήτης. Τα στοιχεία αυτά αποτέλεσαν κρίσιμο στοιχείο στην διαδικασία λήψης αποφάσεων σε όλα τα επίπεδα Πολιτικό/Στρατηγικό, Επιχειρησιακό και Τακτικό, ενώ δοκιμάστηκε για πρώτη φορά η σύγκλιση και λειτουργία του Κέντρου Διαχείρισης Κρίσεων Κρήτης με την ομάδα λήψης αποφάσεων και συλλογής πληροφοριών με εκπροσώπους από τις διοικητικές δομές που προβλέπει η νέα αρχιτεκτονική Αποκεντρωμένης Διοίκησης και Αυτοδιοίκησης του Προγράμματος Καλλικράτης.

Ιδιαίτερη αίσθηση έκανε βίντεο εικονικής πραγματικότητας το οποίο παρουσίασε ο Καθηγητής Κώστας Συνολάκης, διευθυντής ΕΛΚΕΘΑ το οποίο παρουσίαζε τις επιπτώσεις του παλιρροϊκού κύματος στο παλιό λιμάνι των Χανίων, σύμφωνα

με την ανάλυση επικινδυνότητας του σεναρίου της καταστροφής.

Παράλληλα στο πλαίσιο της άσκησης επί Χάρτου δοκιμάστηκε η ενσωμάτωση στην διαδικασία λήψης αποφάσεων νέων τεχνολογιών πληροφορικής και τηλεπικοινωνιών που έχουν αναπτυχθεί από το Ινστιτούτο Πληροφορικής, ΙΤΕ:

Αποστολή SMS για την ενημέρωση των ασκούμενων-παικτών για τον επικείμενο κίνδυνο παλιρροιακού κύματος

Χρήση σύγχρονων πρωτοκόλλων διαλογής και επικοινωνία Συντονιστικού Κέντρου ΕΚΑΒ με τον τμήμα επειγόντων περιστατικών του Νοσοκομείου

Αξιοποίηση γεωγραφικού πληροφοριακού συστήματος για την απεικόνιση περιστατικών, φορέων, και θυμάτων, όπως και την εύρεση πόρων όπως αυτόματου απινιδωτή για την διάσωση πολίτη.

Την τεχνική διεύθυνση διεξαγωγής και συντονισμού της άσκησης έχουν ομάδα της Γενικής Γραμματείας Πολιτικής Προστασίας (ΓΓΠΠ) στην οποία συμμετέχουν η Εθνικός Εκπρόσωπος της χώρας μας στην Ευρωπαϊκή Επιτροπή, ο Υποδιοικητής του Εθνικού Κέντρου Επιχειρήσεων Πολιτικής Προστασίας και η εκπρόσωπος του Τμήματος Ελέγχου και Παρακολούθησης Σχεδίων/Διεύθυνση Σχεδιασμού και Αντιμετώπισης Εκτάκτων Αναγκών.

Στο χαιρετισμό του ο Γενικός Γραμματέας της Αποκεντρωμένης Διοίκησης Κρήτης κ. Αθανάσιος Καρούντζος τόνισε ότι το έργο αυτό είναι εξαιρετικής σημασίας τόσο για τα αποτελέσματα που θα εξαχθούν, όσο και γιατί είναι μια καινοτομία σε ευρωπαϊκό επίπεδο και η οποία θα διεξαχθεί στο νησί μας μέσω της Πολιτικής Προστασίας την υπηρεσία που αποβλέπει στην προστασία της ζωής, υγείας και περιουσίας των πολιτών από φυσικές τεχνολογικές και λοιπές καταστροφές που προκαλούν καταστάσεις εκτάκτου ανάγκης.

(Αγώνας της Κρήτης, 01.06.2011)



### **Ένας ωκεανός χαλάσματα**

#### **Συντρίμια του ιαπωνικού τσουνάμι «κάνουν το γύρο του Ειρηνικού για μια δεκαετία»**

Από αεροπλάνα και αυτοκίνητα μέχρι παιδικά παιχνίδια και μπουκάλια απορρυπαντικών, ανυπολόγιστες ποσότητες συντριμμίων από το φονικό τσουνάμι της Ιαπωνίας έχουν ξεκινήσει ένα ταξίδι στο Βόρειο Ειρηνικό που θα διαρκέσει μια δεκαετία, εκτιμά γαλλική περιβαλλοντική οργάνωση.

Από τους 25 εκατομμύρια τόνους χαλασμάτων στις ακτές της Ιαπωνίας, ένα μεγάλο μέρος παρασύρθηκε στη θάλασσα όταν το σεισμικό κύμα υποχώρησε στις 11 Μαρτίου, εκτιμά η οργάνωση Robin des Bois (Ρομπέν των Δασών).

Προειδοποιεί μάλιστα ότι καύσιμα, λιπαντικά και άλλα τοξικά χημικά θα διαρρέουν για χρόνια από τα επιπλέοντα χαλάσματα.

Σύμφωνα με τους υπολογισμούς της Robin des Bois, οι τεράστιες μάζες συντριμμίων θα χρειαστούν ένα με δύο χρόνια για να διασχίσουν τον Ειρηνικό και να πλησιάσουν τις αμερικανικές ακτές.



Ολόκληρα χωριά διαλύθηκαν από το κύμα και παρασύρθηκαν στη θάλασσα (Φωτογραφία: ΑΠΕ )

Εκεί, τα χωριστούν σε δύο τμήματα, από τα οποία το ένα θα παρασυρθεί προς τα βόρεια από το Ρεύμα της Αλάσκας. Το άλλο θα κινηθεί προς τα νότια, επιπλέοντας πάνω στο Ρεύμα της Καλιφόρνια.

Αυτός ο νότιος κλάδος συντριμμίων θα χωριστεί ξανά σε δύο τμήματα, από τα οποία το πρώτο θα καταλήξει στη λεγόμενη Υποτροπική Ζώνη Σύγκλισης του Βορείου Ειρηνικού, περισσότερο γνωστή ως η Μεγάλη Κηλίδα Σκουπιδιών: μια περιοχή ανάμεσα στη Χαβάη και την Καλιφόρνια όπου τα θαλάσσια ρεύματα τείνουν να συσσωρεύουν πλαστικά αντικείμενα και άλλα απορρίμματα.

Το δεύτερο τμήμα θα αρχίσει αργότερα να κινείται προς τα δυτικά, παρασυρόμενο από το Βόρειο Ισημερινό Ρεύμα, και θα καταλήξει στη λεγόμενη Δυτική Κηλίδα Σκουπιδιών.

«Το όλο ταξίδι γύρω από το Βόρειο Ειρηνικό θα διαρκέσει γύρω στα δέκα χρόνια» δήλωσε στο Γαλλικό Πρακτορείο εκπρόσωπος της Robin des Bois.

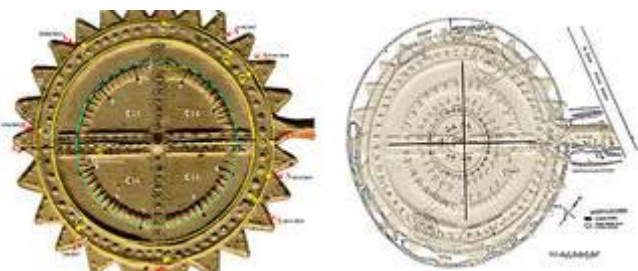
Οι εκτιμήσεις της οργάνωσης βρίσκονται σε συμφωνία με προηγούμενη πρόβλεψη του Πανεπιστημίου της Χαβάης, σύμφωνα με την οποία τα συντρίμια θα αρχίσουν να ξεβράζονται στη Δυτική Ακτή των ΗΠΑ σε περίπου τρία χρόνια.

(ΤΑ ΝΕΑ On-line, 22 Ιουν. 2011)

# ΕΝΔΙΑΦΕΡΟΝΤΑ - ΛΟΙΠΑ

## ΜΙΝΩΙΚΟΣ Ο ΠΡΩΤΟΣ ΑΝΑΛΟΓΙΚΟΣ ΥΠΟΛΟΓΙΣΤΗΣ

Τον πρώτο αναλογικό υπολογιστή στην ιστορία της ανθρωπότητας είχαν ανακαλύψει οι Μινωίτες, όπως υποστηρίζει ο κρητικός ερευνητής αιγαιακών γραφών, Μηνάς Τσικριτής. Σύμφωνα με τον ερευνητή, το μινωικό αντικείμενο, που είχε βρεθεί το 1898 στο Παλαίκαστρο Σητείας, προηγήθηκε του «Μηχανισμού των Αντικυθήρων» κατά 1.400 χρόνια και είναι ο πρώτος αναλογικός υπολογιστής στην Ιστορία και μάλιστα φορητός.



«Αναζητώντας μινωικά ευρήματα με αστρονομικές απεικονίσεις στο Αρχαιολογικό Μουσείο Ηρακλείου, εντοπίσαμε μια λίθινη μήτρα από την περιοχή του Παλαίκαστρου Σητείας. Στην μήτρα αυτή είχαν αναφερθεί ο Στέφανος Ξανθουδίδης και ο Άρθουρ Έβανς, διατυπώνοντας ότι τα ανάγλυφα σύμβολα που εμφανίζονται στην επιφάνεια της μήτρας συσχετίζονται με τον Ήλιο και τη Σελήνη», τονίζει ο κ. Τσικριτής.

Όπως εξηγεί ο κρητικός ερευνητής, αφού πρώτα αναλύθηκε η ανάγλυφη απεικόνιση του ακτινωτού δίσκου στο δεξιό μέρος της μήτρας αυτής, στη συνέχεια τεκμηριώθηκε η χρήση αυτού, ως μήτρα για την κατασκευή ενός μηχανισμού, που χρησίμευε ως αναλογικός υπολογιστής προσδιορισμού εκλείψεων. Ταυτόχρονα εξετάστηκαν οι χρήσεις του μηχανισμού ως ηλιακό ρολόι και ως όργανο υπολογισμού γεωγραφικού πλάτους.

«Η κατασκευή αυτή έχει τη δυνατότητα να προσδιορίσει την ώρα και το γεωγραφικό πλάτος ενός τόπου αν χρησιμοποιήσουμε τα τρία εργαλεία, δύο βελόνες κι έναν διαβήτη, που υπάρχουν στην μήτρα πάνω από το δίσκο», τονίζει ο κ. Τσικριτής και εξηγεί: «Ο ακτινωτός δίσκος έχει στην περιφέρεια 25 τριγωνικά σχήματα αν τα αριθμήσουμε ανά μισή ώρα και τοποθετήσουμε μία βελόνα κάθετα στο κεντρικό βαθούλωμα και προσανατολίσουμε τον κεντρικό σταυρό σε βορρά - νότο, τότε η σκιά της βελόνας δείχνει το σημείο του ακτινωτού δίσκου που αντιστοιχεί στην ώρα της παρατήρησης. Φαίνεται λοιπόν ότι ο μηχανισμός αυτός θα μπορούσε να χρησιμοποιηθεί ως ημερήσιο ηλιακό ρολόι χειρός (12,5ωρών). Από αυτή τη χρήση προκύπτει ότι η ώρα αντιστοιχεί σε περίπου 58 λεπτά, πολύ κοντά στην ώρα που χρησιμοποιείται σήμερα. Θεωρώντας ότι ένας τριγωνικός δείκτης (ακτινωτό τμήμα) αντιστοιχεί σε περίπου μισή ώρα, οι πέντε κουκίδες που υπάρχουν πάνω σε κάθε τριγωνικό δείκτη χωρίζουν αυτόν σε 5 μικρότερες μονάδες χρόνου, διάρκειας περίπου 6 σημεινών λεπτών».

Εξηγώντας ο κ. Τσικριτής τη χρήση του μηχανισμού για τον υπολογισμό του γεωγραφικού πλάτους, τονίζει ότι «αν ο χρήστης του δίσκου χρησιμοποιούσε ως όργανα, μία βελόνα και μία λαβίδα, που υπάρχουν στο αποτύπωμα του πλακιδίου και σημειώνει ανά δύο εβδομάδες την άκρη της σκιάς όταν μεσουρανή ο Ήλιος, τότε θα μπορούσε με την γωνία «ω» να καταγράψει το γεωγραφικό πλάτος του τόπου που βρισκε-

ται. Έτσι σε μελλοντική απομάκρυνσή του από τον τόπο του στο βορρά, βρίσκοντας τη γωνία απόκλισης του τόπου του θα μπορούσε, παρατηρώντας τη σκιά της βελόνας, την αντίστοιχη εβδομάδα, να προσδιορίσει πόσο βόρεια κατευθύνθηκε, ώστε να μπορεί να επιστρέψει».

«Γράφοντας το βιβλίο μου για την «Αστρονομία του Κρητο-μικηναϊκού Πολιτισμού», έφτασα και στο συγκεκριμένο εύρημα. Πρόκειται γι' έναν μικρό, φορητό, αναλογικό υπολογιστή που προσδιορίζει όλες τις εκλείψεις και κάνει την ίδια δουλειά με τον "Μηχανισμό των Αντικυθήρων", τον οποίο μέχρι πρόσφατα θεωρούσαμε τον αρχαιότερο μηχανικό υπολογιστή», δηλώνει και προσθέτει: «Επιπλέον, όμως, τα αντίγραφα αυτού του δίσκου έχουν τη δυνατότητα να δουλεύουν ως ηλιακά ρολόγια, αν τοποθετηθεί μία βελόνα κάθετα στο κέντρο και προσανατολιστεί ο κεντρικός σταυρός σε βορρά-νότο. Παράλληλα μπορούσαν να προσδιορίζουν το γεωγραφικό πλάτος. Είναι ένα όργανο που μπορεί να χρησιμοποιηθεί και στη ναυσιπλοΐα αλλά και στην Αστρονομία».

## Λειτουργία μέχρι σήμερα

«Συνδυάζοντας τις γνώσεις μου για τον Μινωικό Πολιτισμό και την Αστρονομία κατέληξα στο συμπέρασμα ότι η λειτουργία του μηχανισμού αυτού αφορούσε τη μέτρηση του χρόνου και την πρόβλεψη σεληνιακών και ηλιακών εκλείψεων», μας ανέφερε. Η εντυπωσιακή αποκάλυψη του κ. Τσικριτής λειτουργεί μέχρι και σήμερα καθώς, όπως αναφέρει, «διαπιστώνω με το αντίγραφο που κατασκεύασα ότι ο υπολογιστής αυτός είναι σε θέση να προβλέπει τις εκλείψεις. Το επιβεβαίωσα ξεκινώντας από την ολική σεληνιακή έκλειψη στις 21 Δεκεμβρίου 2010 και έφθασα να προβλέπω όλες τις εκλείψεις μέχρι το 2018 χρησιμοποιώντας τον δίσκο αυτόν».

Ο ακτινωτός δίσκος του 15ου αιώνα π.Χ. χωρίζεται σε δύο ημικύκλια, που το καθένα έχει 29 και 30 χαραξίσεις. Αυτά τα ημικύκλια αναπαριστούν δύο σεληνιακούς μήνες 29,5 ημερών, που αρχίζουν και τελειώνουν με πανσέληνο.

Αν, κάθε μέρα, μετακινείται δεξιόστροφα μία βελόνα στον εσωτερικό κύκλο (της Σελήνης) και κάθε δύο μήνες μετακινείται μία άλλη βελόνα με τον ίδιο τρόπο στην περιφέρεια με τα ακτινωτά τριγωνικά δόντια που έχουν 112 τρύπες, τότε καταγράφεται η πορεία της Σελήνης ως προς τη θέση των δεσμών.

Η πορεία του Ήλιου καταγράφεται στον κύκλο της περιφέρειας του Δίσκου με κίνηση αντίθετη από την κίνηση της Σελήνης, ώστε κάθε περίπου 6 μέρες να κινείται μία θέση. Αν συνέπιπτε ο Ήλιος να είναι κοντά σ' ένα δεσμό και η Σελήνη σε πανσέληνο ή νέα Σελήνη, τότε έχουμε έκλειψη. «Οι Μινωίτες γνώριζαν για το φυσικό φαινόμενο που ονομάζεται "Σάρος"», αναφέρει ο κ. Τσικριτής και εξηγεί πως «πρόκειται για το γεγονός ότι οι εκλείψεις επαναλαμβάνονται με την ίδια σειρά κάθε 18,5 σεληνιακά χρόνια».

Ο κ. Τσικριτής, σημειώνει ακόμη ότι «πάνω στη μήτρα που βρέθηκε υπήρχαν δύο βελόνες και μία λαβίδα. Ένας διαβήτης, δηλαδή. Οπότε μ' αυτά τα εργαλεία το δουλεύεις άνετα. Θα μπορούσαμε να το ονομάσουμε ένα μικρό «portable» χρησιμοποιώντας τους όρους της σύγχρονης τεχνολογίας. Το σημαντικό είναι ότι αυτό το εύρημα αλλάζει την ιστορία της Τεχνολογίας, καθώς είναι μια εφεύρεση προγενέστερη του Μηχανισμού των Αντικυθήρων».

Χαρακτηριστικό είναι, ότι με βάση την έρευνα του κρητικού ερευνητή γίνεται συσχετισμός του ευρήματος της Σητείας με το φημισμένο Στόουνχεντζ της Βρετανίας. «Ουσιαστικά το Στόουνχεντζ αποτελεί μια αποτύπωση σε μεγάλη κλίμακα του υπολογιστή αυτού ή κάποιου άλλου αντίστοιχου», τονίζει.

Όπως εξηγεί ο ερευνητής, αν τοποθετηθεί το αποτύπωμα του μηχανισμού του Παλαίκαστρου πάνω σ' ένα σκίτσο του Στόουνχεντζ, έτσι ώστε η ευθεία συμμετρίας που στοχεύει στο θερινό ηλιοστάσιο στο Στόουνχεντζ να ταυτιστεί με την



εσωτερική γραμμή της διπλής σειράς του σταυρού στο δίσκο του Παλαικάστρου και να φέρουμε και μία κάθετη γραμμή στον άξονα, τότε παρατηρείται ότι:

α) οι δύο δίσκοι με τους κάθετους άξονες χωρίζονται σε 4 τεταρτημόρια που καθένα έχει τους ίδιους αριθμούς χαράξεων (14 & 15 άνω, 16 & 14 κάτω) δίσκος Παλαικάστρου, και στο Στόουνχετζ οι κύκλοι Ζ' και Υ' με τις 29 και 30 οπές ταυτίζονται ομοιόμορφα.

β) γενικότερα το πλήθος των χαράξεων 29 και 30 στον εσωτερικό κύκλο του Παλαικάστρου σχετίζονται με το πλήθος των οπών των δύο κύκλων Ζ' (29) και Υ' (30). Το πλήθος αυτών των οπών ή χαράξεων αντιστοιχούν σε σεληνιακό μήνα 29,5 ημερών. Επιπρόσθετα μπορεί το πλήθος των 59 χαράξεων του Παλαικάστρου να ταυτιστεί και με τον κύκλο από 59 μικρότερες γαλαζόπετρες που ονομάζεται (Κύκλος από Γαλαζόπετρες) γύρω από τα 5 τρίλιθα του Στόουνχετζ.

γ) Ο εξωτερικός τελικός κύκλος που περιβάλλει όλο το Στόουνχετζ, με τις 57 οπές με όνομα κύκλος Όμπρι (Aubrey Holes). Μπορεί να ταυτιστεί με τον εξωτερικό κύκλο του δίσκου του Παλαικάστρου που έχει και αυτός 58 οπές.

δ) Μέσα από τα τρίλιθα στο Στόουνχετζ υπάρχουν 19 πέτρες σε σχήμα πέταλου με όνομα (Πέταλο από Γαλαζόπετρες), το ίδιο πλήθος υπάρχει και στο δίσκο του Παλαικάστρου, με μορφή μικρών οπών σε δύο περιοχές του εσωτερικού σταυρού.

«Τελικά με βάση τα περιγραφόμενα διαφαίνεται ότι ο Μινωικός Πολιτισμός θα πρέπει να είχε σχέση και επαφή με τους υπερβορείους, όπως αναφέρει και ο Διόδωρος ο Σικελιώτης», επισημαίνει ο κ. Τσικριτής και προσθέτει ότι «αυτά που έχουμε βρει είναι ελάχιστα και προσωρινά αρχεία των Μινωικών. Αποδεικνύεται ότι είχαν πλούσια γνώση σε τομείς, όπως η Αστρονομία και τα Μαθηματικά. Ήταν ένας Πολιτισμός πολύ προχωρημένος που είχε φτάσει σε διάφορα μέρη του τότε κόσμου».

Επισκεφθείτε το δικτυακό τόπο:

<http://news.pathfinder.gr/culture/news/700087.html#article>

(Πληροφοριακό Δελτίο της Ελληνικής Αρχαιομετρικής Εταιρείας, Τεύχος 122, Μάιος 2011)



### Engineering professor researches seashell-based cement

**All the shells piling up in seafood restaurants could find new life in concrete. That's the idea of a University of Massachusetts Dartmouth professor who envisions mixing seashell waste from the local shellfish industry into concrete. "The industrial use of this material significantly decreases the carbon footprint of concrete by reducing the amount of cement," said Nima Rahbar, a professor of civil and environmental engineering.**

A University of Massachusetts Dartmouth professor is using seashells to develop a cement mixture that is both structurally sound and reduces one's carbon footprint.

Nima Rahbar, assistant professor, Department of Civil and Environmental Engineering, is mixing ordinary cement with seashell waste from the local shellfish industry for potential

use as structural supports and in other decorative applications.

Concrete is the glue that holds most construction materials, such as concrete, together. But its production is an energy-intensive process that involves grinding rocks and kilns that can reach temperatures of 1170C, according to Rahbar.



Dr. Nima Rahbar

By mixing shells into it, Rahbar said he can reduce the energy used to make the cement and help the shellfish industry at the same time.

"I saw a fisherman who said they have a lot of shells and don't know what to do with them," Rahbar said. "They have to pay somebody to get rid of these shells."

A UMass:Dartmouth professor is patenting his environmentally-friendly version of concrete, known as "shellcrete," which mixes cement with seashells to make concrete using far less energy than traditional methods.

But Rahbar pointed out, studies have shown that seashells are as tough as lightweight biological materials. And, he said, they are economically advantageous because of their wide availability and low cost.

"The industrial use of this material significantly decreases the carbon footprint of concrete by reducing the amount of cement in concrete and consequently decreasing the processing energy," he said. "It also helps the public health by eliminating the waste materials, and creates technology for the region by establishing (the new cement) as a sustainable structural material."

Rahbar already has a sample of the material, and is currently performing testing for strength and toughness. He is seeking funding to continue his work, through grants, private industry, or venture capitalist interest.

Rahbar first started studying shells and other materials for a thesis he did at Princeton University, where he earned his Ph.D. in civil engineering in 2008. The theme of his research group is sustainable materials.



He has also studied other materials and has students working on the mechanical processes of bamboo, a material he says has a strength-to-weight ratio that is higher than concrete and steel.

"And in many parts of the world, it grows like a weed," he said.

He finds many of his ideas by looking at nature.



"You look into nature to see how nature does things, and how can we build materials like that?" Rahbar said of his work. "You are looking to nature, and one of the most amazing materials in nature is actually seashells. These materials are very tough and very light. The idea is (to find out) how nature does it."

One of Rahbar's goals is to develop a sustainable multifunctional composite with higher toughness and superior thermal property compared to ordinary composites. He's been working with a variety of shells, and said conk shells have been the most promising. He is currently working to improve the quality and strength of his material, and has already started the patent process.

Helping Rahbar in the process is a team of UMass graduate students who are working on marketing the material and determining applications for it. The students — Lukas Cavallini, Otilia Gomes and Mackendy Mondesir — created a PowerPoint presentation on the material, calling it "shellcrete".

Mondesir, who has an undergraduate degree in mechanical engineering and is currently working toward an MBA, said he and the other students also broke down the classes of concrete and their minimum "specs," such as compressive strength and aggregate size, for slabs and beams, columns, footings, and slab on grade and foundation walls.

Once testing is done, based on the results, they will go about finding applications for the material, he said.

While it can currently be used for something like countertops, Mondesir said "that's not the main focus."

The goal is to use it for structural purposes and applications like columns and beams, so they are reviewing the specs that would have to be met to get into that market.

Rahbar said the material is already ready for nonstructural use, and he is close to achieving the strength and toughness of structural concrete. He said the product will also have better thermal properties than traditional materials. A typical batch of the mixture could include about 5 percent shells for structural use and 15-20 percent for more decorative purposes like countertops.

Rahbar's students are also looking into the LEED certification process, with the hope that building projects could qualify for tax credits by using the material.

"Some people have done concrete with seashells in the past, but they just used random shells and their goal wasn't to make stronger materials," Mondesir said, noting that Rahbar's process, "will allow it to be a stronger material."

(Pamela Berard / The New England Business Bulletin (New Bedford, Mass.), May 31, 2011)



## Company develops sulphur-based construction materials

**Royal Dutch Shell is developing sulphur-based products, such as a paving material for road surfaces and a fast-setting concrete. The company uses mixed molten sulphur and crushed rock to produce sulphur concrete that is salt- and acid-resistant and suitable for use in construction of dikes, dams, canal em-**

**bankments and man-made ponds for aquaculture and waste treatment.**



DOHA // A looming world glut of sulphur is prompting Royal Dutch Shell to come up with new uses for the distinctive yellow substance that is already stockpiled in some gas-producing countries.

At a laboratory in Qatar, the Gulf state with the world's biggest deposit of sulphur-laced gas, researchers test new building materials strengthened with sulphur. They include a plastic-like sulphurated concrete and a sulphur asphalt for road surfaces.

The company hopes to prove that each is more durable than the comparable conventional product as it attempts to develop new sulphur markets.

The poisonous gas hydrogen sulphide is found in many natural gas reservoirs in the Gulf region and elsewhere, especially those that are deeply buried. These so-called sour gas deposits are increasingly being tapped because gas reserves with low sulphur content are depleted.

"We are looking for new applications for sulphur because more and more sour fields are being developed," said Willem Scholten, the research and development manager of the Qatar Shell Research and Technology Centre in Doha.

To make sulphur concrete, molten sulphur, instead of water and cement, is blended with crushed rock. The result is a building material with a smooth plastic surface that is easy to paint and which sets much faster than normal concrete while being more resistant to salty and acidic conditions.

Those properties particularly suit the material to the construction of walls and barriers exposed to water, such as dykes around low-lying land areas, hydro-electric dams, the linings of man-made ponds for aquaculture and waste treatment, and the embankments and locks of canals.

Sulphur concrete might be a particular boon to the construction sectors of fast-growing economies in the Gulf region, where fresh water is in short supply. Qatar would be a double beneficiary because the emirate also lacks the right sort of low-salt sand for making cement.

"In Qatar, sand has to be imported for cement," says Mr Scholten. "If they can use a local product instead of cement, it's a huge gain."

There is just one problem: sulphur concrete softens and melts at 120°C, making it insufficiently fire-resistant for use in most buildings.

That means energy companies face a big challenge to convince construction firms to try the new product, even for specific applications such as water works. That is why Shell researchers are putting moulded sulphur-concrete blocks

through a battery of tests at the research centre to determine the product's limitations and optimise its strengths.

"These are intrinsically conservative industries," Egbert Veldman, the head of Shell Sulphur Solutions, says of construction companies and other potential users of new sulphur-enhanced materials. "They need very significant proof and trials before agreeing to use new products."

Another new material that Shell is field-testing in Qatar, with the aim of getting it certified there for road construction, is sulphur asphalt. Laboratory tests suggest the product is more resistant to rutting, especially in very hot or cold climates. This should make sulphur asphalt a premium road-building material in the Middle East and the continental interiors of Asia and North America.

Shell is therefore also testing sulphur-reinforced asphalt in Canada and China.

But construction companies are likely to adopt the new product only if it is cheap. That depends on sulphur prices staying low.

Rising prices may not become a barrier for some time, however. Already, the major sour-gas producers Canada and Kazakhstan have accumulated yellow mountains of stacked sulphur blocks that are visible from passing aircraft. Abu Dhabi may soon follow when it starts producing large amounts of sulphur as a by-product of gas production at the US\$10 billion (Dh36.73bn) Shah project, which will exploit "ultra-sour" gas.

Qatar's main gas deposits in the North Field contain much lower hydrogen sulphide concentrations than Shah, but the amount of gas being produced and processed from the North Field is so large that Qatar, too, could soon accumulate substantial excess sulphur.

Analysts expect annual global sulphur production to exceed 62 million tonnes in 2015, up from 47 million tonnes in 2007.

Sulphur is currently mainly used to make sulphuric acid and fertiliser.

In addition to building materials, Shell has developed a sulphur-enhanced fertiliser that makes the growth-assisting element more accessible to plants. Trials carried out by the company suggest crop yields in potential markets such as China could be increased by as much as 14 per cent.

Sulphur is the fourth-most important mineral plant nutrient, after nitrogen, phosphorus and potassium.

(Tamsin Carlisle / The National (Abu Dhabi, United Arab Emirates), June 1, 2011)



### **Europe tackles huge fraud Regulators scramble to recover millions of euros awarded to fake research projects**

Stifling bureaucracy is often blamed for discouraging scientists and businesses from participating in the research programmes of the European Commission (EC). But the commission's notoriously cumbersome procedures and rigid control mechanisms have apparently not prevented a criminal syndicate from conducting a brazen fraud that has siphoned off millions in EC grant funds.

Italian authorities and the European Anti-Fraud Office (OLAF) in Brussels, Belgium, have confirmed that they are prosecuting members of a large network accused of pocketing more than €50 million (US\$72 million) in EC grants for fake research projects. In Milan, Italy, the Finance Police last month charged several individuals in relation to the fraud. In Brussels, meanwhile, the EC has terminated four collaborative projects in information technology, and excluded more than 30 grant-winners from participation in around 20 ongoing projects. Investigations are still under way in the United Kingdom, France, Greece, Austria, Sweden, Slovenia and Poland.

"We don't have any records of [previous] fraud at such a scale," says David Boubilil, the commission's spokesman for taxation, customs, anti-fraud and audit. While investigations continue, Italian prosecutors and OLAF will not disclose the names of the suspects, or the research projects with which they were involved.

The fraud has been conducted in a "highly sophisticated manner, resembling money laundering", by means of a cross-border network of fictitious companies and subcontractors, says Pavel Bořkovec, a spokesman for OLAF. Several project coordinators stand accused of having claimed inflated costs, or expenses for non-existent research activities and services, he says.

"The projects were apparently organized with the sole intention to deceive the commission and its control mechanisms," says Boubilil. To make them seem legitimate, grant applications included the names of real scientists, established research institutes and existing companies, he says. But in most cases the alleged project partners were included without their knowing.

Insiders in Brussels say that rare cases of minor financial dishonesty, from inflated invoices to smaller cases of embezzlement, are regarded as unavoidable in large collaborative research projects. But the commission does extensive checks on project partners, including companies, which are meant to catch large-scale fraud. The success of the fraud suggests that those involved were unusually familiar with weaknesses in the EC's procedures, and adept at forging legal documents.

Boubilil insists that the commission has learned lessons from the case. All departments handling research grants — including the EC's Information Society and Media Directorate General, which oversaw the terminated projects — are now trained to look out for the methods used by the network. Guidelines for evaluating projects and their partners are set to be updated. The EC has already recovered €10 million of the money, and will seek to recover the rest through the courts, Boubilil says.

The commission is currently developing a multibillion-dollar 'Common Strategic Framework' which, from 2014, will combine its various funding streams into a single channel for all research and innovation funding. Concerned about the burden of Brussels bureaucracy, several thousand European scientists signed a petition this year ([www.trust-researchers.eu](http://www.trust-researchers.eu)) calling for the framework to be "based on mutual trust and responsible partnering". Some now fear that the fraud could hamper efforts to cut red tape.

"I'm worried that some will argue that what has happened proves that we need more rather than less control," says Herbert Reul, chair of the European Parliament's committee on industry, research and energy, which supports the simplification of the EC's funding procedures. "I sincerely hope that this will not happen. Actually, it is a good sign that this worrying attempt at deceiving the commission has been discovered and will be punished."

(NATURE, Vol. 474, p. 265, 16 June 2011)

## "Θα ανηφορίσει την πλαγιά" η Παναγία στα Γρεβενά

**Η Ιερά Μονή Κοιμήσεως Θεοτόκου Τορνικίου Γρεβενών θα τοποθετηθεί σε "έλκηθρο" και θα μεταφερθεί σε ασφαλές σημείο για να διασωθεί από τα νερά τεχνητής λίμνης του Αλιάκμονα που θα κατακλύσουν την περιοχή.**

Ανεβαίνει στις ράγες και... ανηφορίζει στην πλαγιά. Η Μονή Κοιμήσεως της Θεοτόκου Τορνικίου, έξω από τη Δεσκάτη Γρεβενών, που χρονολογείται στον 15ο αιώνα, θα μεταφερθεί με... έλκηθρο πάνω σε ράγες και θα τοποθετηθεί σε ασφαλές σημείο για να γλιτώσει από τα νερά της τρίτης τεχνητής λίμνης του Αλιάκμονα που θα κατακλύσουν την περιοχή.



Το έργο, που γίνεται με την επίβλεψη του γνωστού αρχιτέκτονα-μηχανικού Δημήτρη Κορρέ και έχει συνολικό προϋπολογισμό 800.000 ευρώ, στοχεύει στη μετακίνηση της μονής σε μία πλαγιά με κλίση 24%.

"Είναι ένα από τα πιο δύσκολα έργα που έχουμε αναλάβει, αλλά ελπίζω πως όλα θα πάνε καλά και δεν θα εμφανιστούν απρόοπτα, που θα μας καθυστερήσουν", είπε στο "Εθνος" ο κ. Κορρές, εξηγώντας πως το καθολικό της μονής, βάρους 300 τόνων και ύψους 10 μέτρων, θα ανηφορίσει για 140 μέτρα και θα βρίσκεται πλέον στην κορυφή ενός μικρού λόφου.

Σύμφωνα με τον προγραμματισμό, η μετακίνηση θα αρχίσει στις 5 Ιουλίου και θα ολοκληρωθεί σε περίπου 10-15 μέρες.

Ηδη προχωρούν οι εκσκαφές γύρω από τη μονή, οι κατεδαφίσεις γειτονικών κτισμάτων, μικρές μετακινήσεις δευτερευόντων τοιχίων, ενώ την επόμενη Δευτέρα θα ξεκινήσουν οι βοηθητικές εργασίες και θα εγκατασταθούν οι ράγες.

"Το καθολικό της μονής πρέπει να μπει σε ένα ασφαλές σημείο για να μην κατακλυστεί από τα νερά. Οι υπόλοιπες κτιριακές υποδομές θα αποσυναρμολογηθούν, θα μεταφερθούν και θα μονταριστούν επιτόπου στη νέα θέση στην πλαγιά", μας είπε ο κ. Κορρές, ο οποίος έχει μακρόχρονη εμπειρία στις μετακινήσεις κτιριακών υποδομών.

Αυτός και η ομάδα του μετέφεραν τον Ναό Αποστόλων Πέτρου και Παύλου στο αεροδρόμιο των Σπάτων, το παλιό κτίριο του ΟΣΕ Θεσσαλονίκης, βάρους 2.000 τόνων, που "τσούλησε" για 45 μέτρα και πήγε στην αρχική του θέση, καθώς εμπόδιζε τη διάνοιξη της δυτικής εισόδου της πόλης, αλλά και την παλιά ιερατική σχολή (Μεντρεσές) που μετακι-

νήθηκε σε απόσταση 25 μέτρων για τη διαπλάτυνση της οδού Λαγκαδά, επίσης στη Θεσσαλονίκη.

Η διάσωση της Μονής Κοιμήσεως της Θεοτόκου Τορνικίου, μαζί με την προστασία και την ανάδειξη της σκήτης του Οσίου Νικάνορα στο παρακείμενο Μοναστήρι της Ζάβορδας στα Γρεβενά, είναι δύο πολύ σημαντικά μνημεία, τα οποία θα διασώσει η ΔΕΗ, πριν από την ολοκλήρωση των έργων για τη δημιουργία της λίμνης του Ιλαρίωνα, στο ομώνυμο φράγμα.

Πώς θα γίνει η μετακίνηση του μνημείου

Σύμφωνα με τον κ. Κορρέ, πάνω στον ναό θα στερεωθούν ειδικά υδραυλικά έμβολα, τα οποία θα τον κινούν πάνω στις ράγες, αργά και σταθερά, ενώ ένας εξωτερικός σκελετός και μια ειδική κατασκευή στα θεμέλια θα προστατεύουν το κτίσμα από τυχόν ανεπανόρθωτες ζημιές.

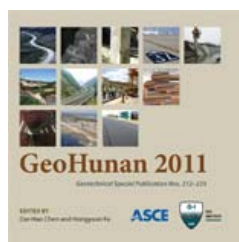
Στόχος των ειδικών είναι να προχωρεί η μονή πέντε μέτρα την ημέρα πάνω στο επικλινές έδαφος, καθώς η ανηφορία δυσκολεύει τη μετακίνηση και απαιτεί ιδιαίτερη προσοχή. Εκτός από το διώροφο καθολικό θα μετακινηθεί στην κορυφή του λόφου και ένα τμήμα από τα υπόλοιπα κτίσματα, ενώ τα περισσότερα θα ανακατασκευαστούν με παλιά υλικά.

Οσο για τις πολύτιμες τοιχογραφίες, που χρονολογούνται στο 1481 και στα 1730 και προέρχονται από το "καστοριανό εργαστήριο", αυτές έχουν ήδη συντηρηθεί και έγιναν οπλισμοί, ώστε να μην υπάρξει κίνδυνος αποκόλλησής τους κατά τη μεταφορά του μνημείου.

(ΕΘΝΟΣ, 20 Ιουνίου 2011)



# ΝΕΕΣ ΕΚΔΟΣΕΙΣ ΣΤΙΣ ΓΕΩΤΕΧΝΙΚΕΣ ΕΠΙΣΤΗΜΕΣ



## GeoHunan 2011

### Emerging Technologies for Design, Construction, Rehabilitation, and Inspection of Transportation Infrastructures

**Dar-Hao Chen & Hongyuan Fu (Editors)**

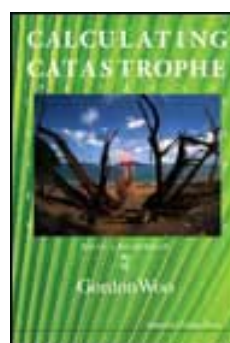
Selected proceedings papers from the 2011 GeoHunan International Conference, held in Hunan, China, June 9-11, 2011. Hosted by Changsha University of Science and Technology; Zhangjiajie-Huayuan Expressway. Cosponsored by Central South University, China; Colombian Geotechnical Society, Colombia; Guangxi Planning, Survey, and Design Institute, China; Guangxi Expressway, China; Hohai University, China; Hunan Highway Association, China; Hunan University, China; Deep Foundation Institute, USA; Federal Highway Administration, U.S. Department of Transportation, USA; Geo-Institute of the American Society of Civil Engineers, USA; International Society for Asphalt Pavements, USA; International Grooving and Grinding Association, USA; Korea Institute of Construction Technology, Korea; North American Chinese Geotechnical Engineers Association, USA; Texas Transportation Institute, USA; Tongji University, China; Transportation Research Board, USA; College of Engineering, University of Oklahoma, USA; Western Transportation Construction of China, China.

These 12 Geotechnical Special Publications contain 361 papers on geotechnical engineering for transportation infrastructure that strike a balance between fundamental theories and field applications. The collection contains the following GSPs:

- GSP 212. *Pavements and Materials: Recent Advances in Design, Testing, and Construction*. Edited by Mansour Solimani, Feng Hong, Moon Won, Seongcheol Choi, and Jianbo Yuan
- GSP 213. *Road Pavement and Material Characterization, Modeling, and Maintenance*. Edited by Wynand JvdM Steyn, Xueyan Liu, Yusuf Mehta, and Zhanping You
- GSP 214. *Condition, Reliability, and Resilience Assessment of Tunnels and Bridges*. Edited by Shen-En Chen, Wei F. Lee, and Hongyuan Fu
- GSP 215. *Contemporary Topics on Testing, Modeling, and Case Studies of Geomaterials, Pavements, and Tunnels*. Edited by Jeffrey L. Lee, Hong Yang, and Zhi-Yi Huang
- GSP 216. *Slope Stability and Earth Retaining Walls*. Edited by Hanlong Liu, Robert Y. Liang, Ke Yang, and Jamal Nusairat
- GSP 217. *Advances in Unsaturated Soil, Geo-Hazard, and Geo-Environmental Engineering*. Edited by Rifat Bulut, Yoshimichi Tsukamoto, An Deng, Takeshi Katsumi, and Takaji Kokusho

- GSP 218. *Emerging Technologies for Material, Design, Rehabilitation, and Inspection of Roadway Pavements*. Edited by Dar-Hao Chen, Jia-Ruey Chang, Musharraf Zaman, Chaoyang Zhao, and Zhanyong Yao
- GSP 219. *Design, Construction, Rehabilitation, and Maintenance of Bridges*. Edited by Pilate Moyo, Phillip Ooi, Endi Zhai, and John Myers
- GSP 220. *Advances in Pile Foundations, Geosynthetics, Geoinvestigations, and Foundation Failure Analysis and Repairs*. Edited by Adam Sevi, Jiuyuan Liu, Cheng-wei Chen, and Sao-Jeng Chao
- GSP 221. *Tunnel Management, Emerging Technologies, and Innovation*. Edited by James Ni, Jun Sheng Yang, Guiyao Wang, and Shong-loong Chen
- GSP 222. *Instrumentation, Testing, and Modeling of Soil and Rock Behavior*. Edited by Louis Ge, Xiong Zhang, António Gomes Correia, and Jason Wu
- GSP 223. *Road Materials and New Innovations in Pavement Engineering*. Edited by Lubinda Walubita, Elie Hajj, Muawia Dafalla, and Zhaohui Liu

(ASCE Publications, 2011)



## Calculating Catastrophe

**Gordon Woo**

*Calculating Catastrophe* has been written to explain, to a general readership, the underlying philosophical ideas and scientific principles that govern catastrophic events, both natural and man-made. Knowledge of the broad range of catastrophes deepens understanding of individual modes of disaster. This book will be of interest to anyone aspiring to understand catastrophes better, but will be of particular value to those engaged in public and corporate policy, and the financial markets.

The author, Dr. Gordon Woo, was trained in mathematical physics at Cambridge, MIT and Harvard, and has made his career as a calculator of catastrophes. His diverse experience includes consulting for IAEA on the seismic safety of nuclear plants and for BP on offshore oil well drilling. As a catastrophist at Risk Management Solutions, he has advanced the insurance modelling of catastrophes, including designing a model for terrorism risk.

### Contents:

- Natural Hazards
- Societal Hazards
- A Sense of Scale
- A Measure of Uncertainty
- A Matter of Time
- Catastrophe Complexity
- Terrorism
- Forecasting
- Disaster Warning
- Disaster Scenarios
- Catastrophe Cover
- Catastrophe Risk Securitization



- Risk Horizons

**Readership:** Applied mathematicians, earth and atmospheric scientists, civil engineers, geographers, economists and general public.

(World Scientific, June 2011)



**Sedimentary Rocks in the Field: A Practical Guide, 4th Edition**

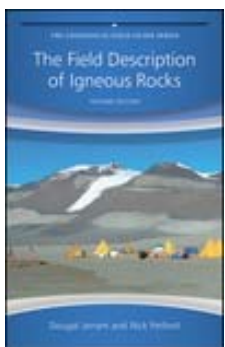
**M. E. Tucker**

This fourth edition builds on the success of previous editions and for the first time is produced in full colour throughout with improved photos and diagrams. It retains its popular

pocket size and is an essential buy for all students working in the field.

The text shows how sedimentary rocks are tackled in the field and has been written for all those with a geological background. It describes how the features of sedimentary rocks can be recorded in the field particularly through the construction of graphic logs. In succeeding chapters the various sedimentary rock types, textures and structures are discussed and shown how they can be described and measured in the field. There are expanded sections on trace fossils and volcanoclastics along with updated reference list. Finally a concluding section deals briefly with facies identification and points the ways towards facies interpretations, and the identification of sequences and cycles.

(Wiley, January 2011)



**The Field Description of Igneous Rocks, 2nd Edition**

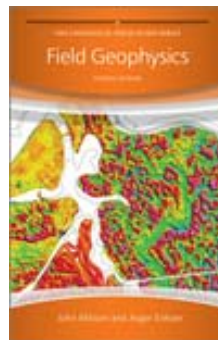
**D. Jerram & N. Petford**

The *Second Edition* of this unique pocket field guide has been thoroughly revised and updated to include advances in physical volcanology, emplacement of magmas and

interpreting structures and textures in igneous rocks. The book integrates new field based techniques (AMS and geophysical studies of pluton shape) with new topics on magma mixing and mingling, sill emplacement and magma sediment interaction. Part of the successful Field Guide series, this book includes revised sections on granitic and basaltic rocks and for the first time a new chapter on the engineering properties of igneous rocks.

The *Geological Field Guide Series* is specifically designed for scientists and students to use in the field when information and resources may be more difficult to access.

(Wiley, January 2011)



**Field Geophysics, 4th Edition**

**J. J. Milsom & A. Eriksen**

This handy pocket-sized field guide provides practical information and assistance to anyone engaged in small-scale surveys on the ground. Fully revised and updated throughout, the *Fourth Edition* includes com-

prehensive updates on the use of GPR and GPS and new sections on surface wave seismics and towed array systems. This has become the standard text in this area for use in the field and the experience of the two authors will ensure the book retains its place as one of the most popular handbooks in applied geophysics.

(Wiley, February 2011)



**Ground Improvement Technologies and Case Histories**

**C. F. Leung, J. Chu, R. F. Shen (Editors)**

This book includes the keynote lectures written by international renowned researchers and specialists

which reflect the state-of-the-practice on the topics discussed on Ground Improvement Technologies and Case Histories. It is heartening to note that 94 papers from 22 countries are included in this book. These papers were selected after a rigorous review process and these papers provides a platform for engineers and researchers to interact and exchange experience on ground improvement technologies and share know-how from case histories.

This book covers the wide range of topics include:

- Recent Development in Ground Improvement Technologies
- Case Histories involving Major Infrastructure Projects
- Design and Analytical Methods in Ground Improvement
- Instrumentation and Monitoring in Ground Improvement
- Variability/Quality Control Issues in Ground Improvement
- Laboratory and Centrifuge Model Testing on Ground Improvement Studies, and
- Case Studies on Ground Improvement.

**Keynotes**

- D T Bergado, Thailand *Behavior of Deep Cement Mixing (DCM) and Stiffened Deep Cement Mixing (SDCM) Piles under Full Scale Tests and Embankment Loading*
- M C R Davies, New Zealand *The Performance of Soil Nailed Systems*
- B Indraratna, Australia *Soft Soil Foundation improved by Vacuum and Surcharge Preloading at Ballina Bypass, Australia*
- M Kitazume, Japan *Ground Improvement in Tokyo/ Haneda International Airport Expansion Project*
- H L Liu, China *New Composite Foundation Techniques For Soil Improvement In China*

- S Pinto, Portugal *Rehabilitation and Reinforcement of Marina EXPO Breakwaters*
- V R Raju, Singapore *Ground Improvement — Principles and Applications in Asia*
- S Varaksin, France: *Formulation of a Concept And Realistic Soil Parameters For The Foundation Of Randomly Located Structures On A Mega Scaled Project*

Readership: Civil engineers, scientists, researchers, graduates and post-graduates in geotechnical engineering. Also, it will be a useful source of reference to geotechnical engineers and professionals.

(Research Publishing Services, 2010)

### **ICOLD Forum: Bulletin on concrete-faced rockfill dams**

The International Commission on Large Dams (ICOLD) offers a technical bulletin devoted to design concepts, analysis, foundation treatment, instrumentation, construction, and performance of concrete-faced rockfill dams (CFRD). Bulletin 141, *Concrete Face Rockfill Dams – Concepts for Design and Construction*, was prepared by the ICOLD Committee on Materials for Fill Dams.

The origin of CFRDs is the Sierra Nevada in California, USA, in the 1850s, the bulletin states. With the advent of vibratory-roller-compacted rockfill in the 1950s, the development of CFRDs progressed. Today, this is a major dam type, with 68 completed between 1990 and 2000, the bulletin says.

The bulletin is divided into 11 chapters:

- Development of CFRDs;
- Analyses for design;
- Foundation excavation, treatment;
- Plinth (dimensions, geometric layout, stability, etc.);
- Perimeter joints and waterstops;
- Face slab (behavior, dimensions, crack development, etc.);
- Parapet wall (height, joints, crest width, etc.);
- Embankment zones and properties;
- Instrumentation;
- Performance of CFRDs; and
- Appurtenant structures (such as low-level outlets and spillways).

The 402-page bulletin uses data from Bulletin 70 (published in 1989), as well as the proceedings of several conferences.

To order this bulletin for €90 (US\$122.50), visit [www.icold-cigb.org](http://www.icold-cigb.org) and click on Publications, then Bulletins.

-- ICOLD is a nongovernmental organization that provides a forum for the exchange of knowledge and experience in dam engineering. To learn more about ICOLD activities, contact Michel De Vivo, Secretary-General, ICOLD, 61 avenue Kleber, Paris 75116 France; (33) 1-47041780; E-mail: [secretaire.general@icold-cigb.org](mailto:secretaire.general@icold-cigb.org).



### **Geotechnical Engineering: Principles & Practices, 2/E**

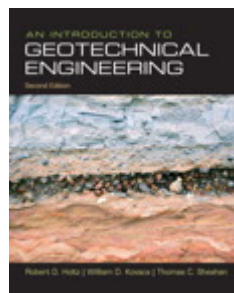
**D. P. Coduto, M. R. Yeung, W. A. Kitch**

This introductory geotechnical engineering textbook explores both the principles of soil mechanics and their application to engineering practice. It offers a rigorous, yet accessible and easy-to-read approach, as well as technical depth and an emphasis on understanding the physical basis for soil behavior.

The second edition has been revised to include updated content and many new problems and exercises, as well as to reflect feedback from reviewers and the authors' own experiences.

For junior-level soil mechanics or introductory geotechnical engineering courses.

(Prentice Hall, 2011)



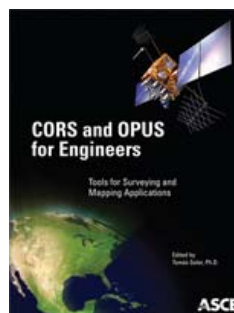
### **Introduction to Geotechnical Engineering, 2/E**

**R. D. Holtz, W. D. Kovacs, T. C. Sheahan**

Intended for use in the first of a two course sequence in geotechnical engineering usually taught to third - and fourth - year undergraduate civil engineering students.

An Introduction to Geotechnical Engineering offers a descriptive, elementary introduction to geotechnical engineering with applications to civil engineering practice.

(Prentice Hall, 2011)



### **CORS and OPUS for Engineers**

**Tools for Surveying and Mapping Applications**

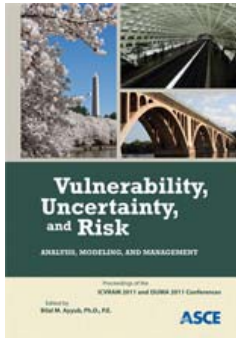
**Tomás Soler (Editor)**

*CORS and OPUS for Engineers* describes new global positioning system (GPS) technologies and procedures that are immediately relevant to civil engineering professionals engaged in high-accuracy positioning. This collection of 22 articles, half new and half previously published in peer-reviewed journals, assembles the latest thinking on the use of two advanced services-CORS and OPUS-for obtaining accurate positional coordinates. Created and managed under the auspices of the National Geodetic Survey, the CORS (continuously operating reference stations) network contains more than 1,600 permanent, geodetic-quality receivers that collect GPS data around the clock at locations distributed throughout the United States, its territories, and a few for-

sign countries. These data are then made freely available to the public via the Internet. OPUS (online positioning user service) is a free, automated, Web-based utility that provides its users with accurate and reliable positional coordinates in a timely fashion by processing each user's GPS data with corresponding data from the CORS network. Together, CORS and OPUS form the backbone of today's high-accuracy, three-dimensional positioning activities.

Both theoretical and empirical, this collection is a must-have for practitioners and researchers involved in surveying, GIS, remote sensing, and mapping applications that utilize GPS technology.

(ASCE Publicationw, 2011)



### **Vulnerability, Uncertainty, and Risk**

#### **Analysis, Modeling, and Management**

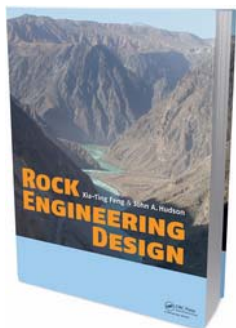
**Bilal M. Ayyub (Editor)**

Proceedings of the International Conference on Vulnerability and Risk Analysis and Management (ICVRAM 2011) and the International Symposium on Uncertainty Modeling and Analysis (ISUMA 2011), held in Hyattsville, Maryland, April 11-13, 2011. Sponsored by the Council on Disaster Risk Management of ASCE.

This collection contains 119 peer-reviewed papers that build upon recent significant advances in the modeling, analysis, and management of risk, vulnerability, and uncertainty. Yet, even as advancements are made in technology, new hazards appear. These papers demonstrate the transformation of intellectual discussions into robust frameworks for handling emerging vulnerabilities and risks and providing analytical bases to prepare for national and international disasters.

These papers will be valuable to experts, decision-makers, and others involved in assessing, planning responses to, and managing vulnerability and risk.

(ASCE Publicationw, 2011)



### **Rock Engineering Design**

**Xia-Ting Feng and John A. Hudson**

With a modern approach and anticipating future developments, this volume introduces a fresh methodology for the design of all types of

rock engineering projects, both at the surface and underground. Guidance is provided on the nature of modelling to support design, on flowcharts, on the information required and on the procedure for the technical auditing of modelling and design. Moreover, the use of computer programs, model calibration through site observation, interpretation of computer results and virtual underground laboratories are described and explained. Elaborate case studies on the de-

sign and construction of a rock slope and of a large underground hydroelectric plant, as well as technical auditing protocol sheets with examples, further facilitate bringing theory into practice.

The book is a product of the Commission on Rock Engineering Design Methodology of the ISRM. Written by two eminent authors, this illustrated guidebook will benefit engineers, contractors, clients, researchers, lecturers and advanced students who are working on rock engineering projects in civil, mining, geological and construction engineering. The book is organised in the following eight chapters.

1. Introduction
2. The ways ahead for rock engineering design methodologies
3. Flowcharts for rock engineering modelling and design
4. Specifying the information required for rock mechanics modeling and rock engineering design
5. Technical auditing of rock mechanics modelling and rock engineering design
6. Case example of the design and construction of a rock slope
7. Case example of the design and construction of a large underground hydroelectric powerhouse in a deep valley region
8. Protocol Sheets
9. Illustrative example of the Protocol Sheets use
10. Concluding remarks

Templates of the protocol sheets and more information can be accessed at [www.crcpress.com](http://www.crcpress.com).

(CRC Press, June 2011)



# ΗΛΕΚΤΡΟΝΙΚΑ ΠΕΡΙΟΔΙΚΑ



<http://www.issmge.org/web/page.aspx?refid=737>

Κυκλοφόρησε το 2<sup>ο</sup> Τεύχος του 5<sup>ου</sup> Τόμου του ISSMGE Bulletin με ενδιαφέροντα νέα από την διεθνή γεωτεχνική κοινότητα και άρθρα για τους σεισμούς της Νέας Ζηλανδίας και της Ιαπωνίας: «Geotechnical Damage due to the 2011 Christchurch, New Zealand» και «On Gigantic Tohoku Pacific Earthquake in Japan», case studies για Deep Mixing for the New Orleans East.



[www.geoengineer.org](http://www.geoengineer.org)

Κυκλοφόρησαν τα Τεύχη #77 του **Newsletter του Geoengineer.org** (Μάιος 2011) με πολλές χρήσιμες πληροφορίες για όλα τα θέματα της γεωτεχνικής μηχανικής. Υπενθυμίζεται ότι το Newsletter εκδίδεται από τον συνάδελφο και μέλος της ΕΕΕΕΓΜ Δημήτρη Ζέκκο ([secretariat@geoengineer.org](mailto:secretariat@geoengineer.org)).



International Society for Rock Mechanics



No. 14 - June 2011

[http://www.isrm.net/adm/newsletter/ver\\_html.php?id\\_newsletter=63&ver=1](http://www.isrm.net/adm/newsletter/ver_html.php?id_newsletter=63&ver=1)

Κυκλοφόρησε το Τεύχος 14 / Ιούνιος 2011 του Newsletter της International Society for Rock Mechanics.



[www.piarc.org](http://www.piarc.org)



<http://www.piarc.org/library/aipcr/9/3229,Newsletter25-EN-June2011bis.pdf>

Κυκλοφόρησε το Τεύχος No. 41 (Μάιος 2011) του **Newsletter της World Road Association (PIARC)** και το Τεύχος No. 25 (Μάιος 2011) του Newsletter των PIARC National Committees.



**INTERNATIONAL TUNNELLING AND  
UNDERGROUND SPACE ASSOCIATION**  
ita@news n°39

[http://ita-aites.org/index.php?id=813&no\\_cache=1](http://ita-aites.org/index.php?id=813&no_cache=1)

Κυκλοφόρησε το Τεύχος No. 39 - Ιούνιος 2011 των ita@news της International Tunnelling Association.



[http://www.itacet.org/Newsletter/02\\_2011/newsletter\\_2\\_2011.php](http://www.itacet.org/Newsletter/02_2011/newsletter_2_2011.php)

Κυκλοφόρησε το Τεύχος No. 7 (Μάιος 2011) του ITACET Foundation.



## **ΕΕΕΕΓΜ**

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