



CASCAIS WORLD FORUM 2012

SOIL BIOENGINEERING AND LAND MANAGEMENT NEW CHALLENGES

Sustaining Our Land, Water
and Life in Changing Climate

II Congress APENA - VII Congress AEIP – VI Congress EFIB

Cascais, Portugal, 19-22 September 2012



Presidência da República

Under the High Patronage of His Excellency
the President of the Portuguese Republic





A) GENERAL INFORMATION

EFIB (European Federation for Soil Bioengineering), APENA (Associação Portuguesa de Engenharia Natural), Portugal (www.apena.pt) and AEIP (Asociación Española de Ingeniería del Paisaje), together with Cascais Municipality, cordially invite you to our International Congress, under the title “Bioengineering and Land Management - New Challenges” to be held September 19 (Wednesday) -22 (Saturday), 2012, at Cascais, Portugal.

About

The theory of the four basic elements - water, soil, air, and fire, proposed by Empedocles (ca. 490-430 BC), remained commonly accepted for more than 2000 years. While science has improved dramatically, upon Empedocles' notions, researchers today are often so specialized that they lose sight of the multiple elements. We are considering these last elements as they are manifestations in relation to:

- the current challenges and trends, in Bioengineering, Ecology and Sustainability Solutions.
- the United Nations Conference on Sustainable Development (UNCSD), held in Brazil in June 2012, 20 years after the Rio Summit 1992 and 10 years after the Johannesburg Summit 2002.

Objectives:

- Provide a global venue, with scientific sessions and world-known speakers, for professionals, decision makers, researchers and students from diverse backgrounds, including the earth sciences, bioengineering, landscape architecture, natural resources, land management and public policies.
- Discuss new developments in the science and practice of low-cost, effective solutions, in bioengineering.
- Identify biodiversity and ecosystem aspects useful to establish the ecological status of landscapes.
- Promote tools for a more appropriate land management, especially in urban and peri-urban areas.
- Provide practical solutions to the imbalances between Nature and Humanity, in communion with the results of Rio +20 Summit, to be held in June 2012.



- Amplify knowledge and experience of EU Water Framework Directive (WFD) and other policies involved in soil restoration and landscape management.

Scientific Areas:

1. Landscape and Land Management
2. Slope Stabilization & Restoration
3. Fluvial and Coastal Stabilization & Restoration
4. Ecological Quality and Biodiversity
5. Combating Desertification
6. Rainwater Harvesting
7. Recuperation and Renaturalization of Degraded Areas
8. Requalification and Rehabilitation in Urban and Peri-Urban Areas
9. Greenways
10. Policy Implementation for Land Restoration and Conservation

Official languages: English, Spanish and Portuguese

Conference Venue: Centro Cultural de Cascais, Cascais, Portugal
(GPS: N 38° 41' 38.92", W 9° 25' 17.38")

Co-Sponsorship:

1. Associação Portuguesa de Corredores Verdes (APCV), Portugal (www.apcverdes.org)
2. Associação Portuguesa de Ecologia da Paisagem (APEP), Portugal (www.apep.pt)
3. Centro Ibérico de Restauração Fluvial (CIREF), Portugal and Spain (www.cirefluvial.com)
4. Associazione Italiana per la Ingegneria Naturalistica (AIPIN), Italy (www.aipin.it)
5. Verein für Ingenieurbiologie, Switzerland (www.ingenieurbiologie.ch)
6. Gesellschaft für Ingenieurbiologie e.V., Germany (www.ingenieurbiologie.com)
7. Association Française de Génie Biologique pour le Contrôle de l'Érosion des Sols (AGEBIO), France (www.agebio.org)
8. Fachvereinigung Betriebs- und Regenwassernutzung (FBR), Germany (www.fbr.de)
9. Universidade Católica Portuguesa - Faculdade de Engenharia, Lisbon, Portugal (www.fe.lisboa.ucp.pt)

10. Universidade Técnica de Lisboa - Instituto Superior de Agronomia, Lisbon, Portugal (www.isa.utl.pt)
11. Universidade de Trás-os-Montes e Alto Douro (UTAD) (www.utad.pt)
12. Universität für Bodenkultur Wien (BOKU), Austria (www.boku.ac.at)
13. Technische Universität Berlin, Berlin, Germany (www.tu-berlin.de)
14. University of California - Berkeley, USA (<http://berkeley.edu>)
15. Universidade Federal do Paraná, Curitiba, Brasil (www.ufpr.br)
16. University of Florida, USA (www.ufl.edu)
17. Universidade Federal de Santa Maria, Santa Maria, Brasil (www.ufsm.br)
18. University of New Orleans - Pontchartrain Institute for Environmental Sciences (UNO-PIES), USA (www.pies.uno.edu)
19. Universidade de Lisboa - Centro de Estudos Geográficos (UL-CEG), Portugal (www.ceg.ul.pt)

Forum Proceedings: A book of abstracts is available for each participant. Selected papers of the proceedings will be the subject of a specific book. Manuscripts to be submitted for publication in the proceedings will be collected at the Forum.

Committee Compositions:

1 Honor Committee

1. Aníbal Cavaco Silva (President of the Portuguese Republic)
2. Pedro Passos Coelho* (Prime Minister of Portugal)
3. Assunção Cristas* (Minister of Agriculture, Sea, Environment and Regional Planning)
4. Daniel Campelo* (Secretary of State for Forestry and Rural Development)
5. Pedro Afonso de Paulo* (Secretary of State for Environment and Regional Planning)
6. Paula Sarmento (President of the Institute for Nature Conservation and Biodiversity)



7. Manuel Braga da Cruz (Rector of the Universidade Catolica Portuguesa)
8. Carlos Manuel de Jesus Carreiras (Mayor of Camara Municipal de Cascais)

(*): to be confirmed

2 Organizing Committee

1. Jose Matos Silva (Chair)* (APENA, UCP); Portugal
2. Paola Sangalli (Vice-Chair)* (AEIP), Spain
3. Joao Melo (CMC), Portugal
4. Rui Cortes (CIREF, UTAD), Portugal
5. Pedro Martinho* (APENA), Portugal
6. Vasco Silva* (CMC), Portugal
7. Eike Flebbe (APENA)*, Portugal
8. Eva Hacker (EFIB), Germany
9. Pilar Barraqueta (AEIP), Spain
10. Albert Sorolla (AEIP), Spain
11. Carlo Bifulco* (APENA, AIPIN, ISA), Portugal
12. Florin Florineth (EFIB, BOKU), Austria
13. Joao Azevedo (APEP, IPB), Portugal
14. Carlos Mendonca (BMC), Portugal
15. Artur Ribeiro* (APENA), Portugal
16. Rui Teles* (APENA), Portugal
17. Pedro Tomás* (APENA), Portugal
18. Aldo Freitas* (APENA), Portugal

(*): Executive Committee

3 Scientific Committee

1. Eva Hacker (Chair) (President of EFIB, Professor at Hannover University, Germany)
2. Jose Matos Silva (Vice-Chair) (President of APENA, Professor at Lisbon Catholic University, Portugal)
3. Paola Sangalli (Founder and President of AEIP, Spain)
4. Giuliano Sauli (Founder and President of AIPIN, Italy)
5. Francisco Castro Rego (Professor at ISA- Lisbon, Director of CEABN, APCV, Portugal)

6. Rui Cortes (Professor at UTAD, Vice-President of CIREF, Portugal)
7. Mathias Kondolf (Professor at the University of California, Berkeley, USA)
8. Florin Florineth (Professor at BOKU, Vienna, EFIB, Austria)
9. Freddy Rey (Research Fellow, Cemagref de Grenoble, President of AGEPIO, France)
10. Mauricio Balensiefer (Professor at UFPR, Curitiba, President of SOBRADE, RIACRE, Brazil)
11. Francisco Escobedo (Professor at SFRC, University of Florida, USA)
12. Fabrício Sutili (Professor at UFSM, Santa Maria, Brazil)
13. Joao F. Pereira (Post-Doctoral Researcher at UNO-PIES, USA)
14. Marco Schmidt (Professor at Technische Universität Berlin, Berlin, Germany)
15. Diogo de Abreu (Professor at UL, Director of CEG, Portugal)
16. João Azevedo (President of APEP, Professor at IPB, Portugal)

B) PRESENTATIONS AND ESTABLISHED TIMETABLES

Presentations will be made in the form of lectures or posters.

Oral presentations will be grouped by topic and limited to 15 to 30 minutes, depending on the program.

Posters will be on display throughout the forum days. In the coffee- and lunch-breaks, participants will have greater opportunity to watch them, ask questions and clarify doubts about them.

Do not expect a mundane international event, open to everyone, but rather a Stakeholders Reunion.

There was a large affluence to this Forum. At the same time, at the request of most people, there will be no parallel sessions. And, there is no money to pay simultaneous translations and rent of the corresponding equipment. We are also aware that, in addition to the three official languages, there are colleagues, e.g., from Italy, Germany, Austria and USA, who only speak and understand well their native languages.



All this involves an **intense program**, and **good will of all**. Hence, we appeal to all participants, to collaborate with us and **meet** the tight **established timetables**.

C) APPLICATION FORM AND REGISTRATION FEES (EUROS):

First Name: _____ Last Name: _____
 E-mail: _____ Tel: _____
 Address: _____ Post Code: _____
 City: _____ Country: _____

(Please, send copy of the Application Form and Bank Transfer, with name, to cascaiswf2012@cascaisnatura.org)

Status		Fees (Euros)
EFIB Members(*)	Regular	340€
	Low/Middle Income Country*	290€
	Full-time Student**	170€
Non Members	Regular	400€
	Low/Middle Income Country*	310€
	Full-time Student**	220€
Accompanying Persons		125€

(*): Members of National Associations affiliated with EFIB.

(*): See the World Bank country listing for Low-income, Lower-middle-income and Upper-middle-income.

(**): Only those who are full-time undergraduate or graduate students at the time of the conference, or who have graduated within 6 months prior to the conference date, qualify for a student rate. Once you complete your registration, please send us proof of your student status (a scanned copy of your student ID card, confirmation of enrollment, acceptance letter, etc.).

Notes:

- All fees are in Euros.
- The conference full registration fee includes participation in sessions, conference materials and catering breaks. It also includes one ticket for the Welcome Dinner, on Wednesday, September 19.

- The conference student registration fee includes participation in sessions, all conference materials and day time catering at the conference, but it does not include entry to the conference dinner. Special tickets are available until Wednesday, September 19, in the morning, for 15 Euros/seat.
- Attendees' registration and social function ticket fees do not include insurance of any kind.

Payment:

Account Holder: APENA
 Address: Rua Amoreiras, 101, 1250-020 Lisbon, Portugal
 Bank: CGD
 National Transfers: NIB: 0035 0373 0001 0665 3300 5
 International Transfers:
 IBAN: PT50 0035 0373 0001 0665 3300 5
 BIC/SWIFT: CGDIPTPL

D) INVITATION FOR SPONSORS

Organizations may find several opportunities and forms of participation:

- Submit a real problem, asking for proposed solutions;
- Dynamic interaction with the participants;
- Association of the organization name to the event.

E) TOURISM

Cascais, Portugal, delimited by the Atlantic Ocean to the south and west, is one of the most pleasant regions in Europe, well known as a place of vast nature, heritage and cultural attractions. Located just a few kilometers away, Lisbon is one of the oldest European capitals, with all that this implies in terms of atmosphere, trade and culture. The region offers year-round warm temperatures. September is a popular time of the year for residents and tourists alike to stroll through the streets of Cascais to enjoy artisan displays, music and dance in the downtown plazas near Town Hall.



G) PROGRAM:

Time	Tuesday Sep 18, 2012	Wednesday Sep 19, 2012	Thursday Sep 20, 2012	Friday Sep 21, 2012	Saturday Sep 22, 2012
8:00		Registration	Registration	Registration	
9:00		Opening Ceremony	Eva Hacker	M. Balensiefer	
9:15		Inaugural Lecture: Alex McCorquodale			
9:30			Giuliano Sauli	Bet Moia et al.	
9:45		João Pereira et al.		Pilar Barraqueta	
10:00		Grecia Teran et al.	Freddy Rey	A. Kozovits	
10:15		Rui Cortes et al.	H. Peter Rauch	Bruno Barbosa	
10:30		Miguel Brito et al.	Sandro Holanda	Alberto Ayesa	
10:45		Questions & Answers	Q. & Answers	Q. & Answers	
11:00		Coffee Break	Coffee Break	Coffee Break	
11:30		Florin Florineth	Paola Sangalli	Rolf Studer	
12:00		Fabrizio Sutili	Paolo Cornellini	Carla Antunes	
12:15		Clemens Weisteiner	Carlo Bifulco et al.	Pino Donorzo	
12:30		Jose Cardão et al.	Gonçalo Fonseca	Ciro Costagliola	
12:45		Questions & Answers	Q. & Answers	Q. & Answers	
13:00		Lunch Break	Lunch Break	Closing Session	
13:30				Lunch Break	
14:30		Jose M. Silva et al.	M. Valenzuela		
14:45			F. Correia et al.		
15:00		Gracia Saraiva et al.	M. Leite et al.		
15:15		Mikel Sarriegi et al.	João Azevedo		
15:30	Registration	Marco Vicari et al.	Inês L. Fonseca		
15:45		Joaquim Jesus	Ana Filipa Leite		
16:00		Elke Fiebbe et al.	Sara Santos et al.		
16:15		Kristian Ceppas	Q. & Answers		
16:30		Questions & Answers			
16:45		Coffee Break	Coffee Break		
17:00		Francisco Escobedo	Marco Schmidt		
17:30		Maria M. Silva	Tatiana Veladetska		
17:45		Albert Sorolla et al.	Mariangela Leite		
18:00		Inês Correia et al.	Sofia Campo et al.		
18:15		Questions & Answers	Q. & Answers		
18:30			Mathias Kondolf		
18:45		Round Table	Anna Ulobet		
19:00		Ice Breaker and Port Wine Reception	Round Table		
20:00			EFIB Meeting		
20:30		Welcome Dinner		Optional Tour "Lisbon by Night"	
	EXPO	EXPO	EXPO		

H) CHAIRPERSONS
AND INVITED SPEAKERS



EVA HACKER

President of EFIB (European Federation for Soil Bioengineering), Professor at Leibniz Universität Hannover, Germany. Main Fields: Bioengineering, Conservation, Landscape Planning.



PAOLA SANGALLI

Degree in Biology, Central University of Barcelona, and Master in Landscape Design (Polytechnic University of Valencia). President of AEIP (Asociación Española de Ingeniería del Paisaje), member of EFIB (European Federation Bioengineering, AEP (Asociación Española de Paisajistas), CIREF (Centro Ibérico para la Restauración Fluvial) and FEAP (Fédération Européenne Architecture du Paysage). Professor in the Master of Landscape Architecture Juana de Vega and at the Master in Landscape Architecture -EHU-UPV (University Basque Country). Organization and lecture of short courses and conferences in Soil Bioengineering, in various countries. Professional activity and experience in nursery, landscape and garden design and in bioengineering and ecological restoration.



G. MATHIAS KONDOLF

Fluvial geomorphologist and environmental planner, specializing in environmental river management and restoration. As a Professor of Environmental Planning at the University of California, Berkeley, he teaches courses in hydrology, river restoration, environmental science, and Mediterranean-climate landscapes, advises students in these subjects, and serves as Chair of the Department of Landscape Architecture and Environmental Planning. He is currently the Clarke Scholar at the Institute



for Water Resources of the US Army Corps of Engineers in Washington, and formerly served on the Environmental Advisory Board to the Chief of the Corps.



ALEX MCCORQUODALE

Freeport McMoRan (FMI) Professor of Environmental Modeling in the Department of Civil and Environmental Engineering at the University of New Orleans. He holds a Ph.D. in Hydraulic Engineering from the University of Windsor, Canada. He is currently director

of the FMI Center for Environmental Modeling at the University of New Orleans. His research interests include physical and numerical modeling of environment processes involving flood control, hydraulics of water and waste water treatment systems, transient analyses of forcemains and water distributions systems and shore protection. He has published more than 100 refereed articles and three books. He has over forty year experience as a hydraulic consultant to engineering firms and government agencies in Canada and the United States.



GIULIANO SAULI

Degree in Natural Sciences, Sciences Trieste University (thesis in botany 110/110 cum laude). Founder and President of A.I.P.I.N. (Associazione Italiana per la Ingegneria Naturalistica), since 1990, and author of more than 300 projects and 200 publications

and papers. Areas of research: Soil Bioengineering, Environmental Engineering and Environmental Impact assessment.



FLORIN FLORINETH

Head of Institute of Soil Bioengineering and Landscape Construction, Universität für Bodenkultur (BOKU), Vienna - Austria / Department of Civil Engineering and Natural Hazards / Institute of Soil Bioengineering and Landscape Construction (IBLB). Secretary

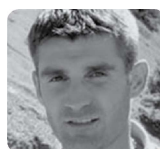
of EFIB (European Federation for Soil Bioengineering).

Expertise: soil bioengineering; vegetation technology; botany; erosion (erosion control); torrents and avalanches research; soil science; construction technology; green area planning; soil science; environmental organization; landscape planning.



ROLF STUDER

Dep. Chairman of EFIB (European Federation for Soil Bioengineering), Vice-President of Verein für Ingenieurbiologie, Switzerland.



FREDDY REY

PhD Grenoble, Université Joseph Fourier Grenoble I. He works at Cemagref (Grenoble, France), as a Forest Engineer and Doctor of Management of Mountain Areas. President of AGEPIO (Association Française de Génie Biologique pour le Contrôle de l'Érosion des

Sols). Areas of research: Interactions between vegetation and erosion, restoration ecology applied to community eroded mountain, ecological engineering.



MARCO SCHMIDT

Marco Schmidt studied Landscape Architecture and Environmental Planning in Berlin. He worked on various urban ecological demonstration projects, commissioned by the Berlin Senate for Urban Development and the Federal Ministry of Economics and

Technology. Main focus is the evaluation of buildings especially regarding water balance modifications, energy consumption, urban heat island effect and climate change mitigation strategies which focus on evaporation rather than greenhouse gas emissions. Since 1992, teaching and research activities at the Technical University of Berlin and the University of Applied Sciences in Neubrandenburg on developing the necessary skills and best practice in ecological construction.





FRANCISCO J. ESCOBEDO

Assistant Professor and Extension Specialist at the University of Florida, School of Forest Resources and Conservation. His research and extension work focuses on urban and community forest management, hurricane effects and ecosystem services. He has worked

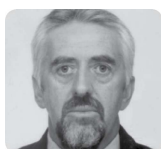
with the UFORE model (i-Tree Eco) for the last eight years and co-developed the i-Tree Storm hurricane adaptation. Dr. Escobedo worked for 13 years with the USDA Forest Service and holds a BS degree in Soil Science from New Mexico State University, a MS degree in Watershed Management from the University of Arizona and a Doctorate in Forest Resources Management, Environmental and Natural Resources Policy from State University of New York.



PAOLO CORNELINI

Civil Engineer (1971) and Doctor of Natural Sciences (1986). Author of 70 publications in the field of environmental design and engineering nature. Co-author of Manual of environmental engineering of the Lazio Region and the Ministry of Environment.

Vice President of A.I.P.I.N. (Associazione Italiana per la Ingegneria Naturalistica). Co-Lecturer in the Master of Science of Faculty of Agriculture of the University of Tuscia (Viterbo). Lecturer in more than 130 courses and seminars at universities, vocational training centers, regional administrations, professional associations.



MAURICIO BALENSIEFER

Graduate Engineer in Forestry at the Federal University of Paraná. Post-graduate degree in Forestry at the Federal University of Parana. Professor at the Department of Forest Science of the Federal University of Parana, Coordinator of Recovery of Degraded

Areas - since 1982. President of the Brazilian Society for Rehabilitation of Degraded Areas (SOBRADE). 16 years experience working in coordination, development, implementation and training in Environmental Restoration. Member of the Coordinating Board of the Iberoamerican Network and Caribbean Ecological Restoration, since 2007;

Representative of the International Society for Ecological Restoration, SER International for Latin America and the Caribbean (2007-2011).



JOÃO FAISCA PEREIRA

M. Sc. degree in Hydraulics and Water Resources at Instituto Superior Tecnico (IST), Technical University of Lisbon, Portugal. He got his Ph.D. in Engineering and Applied Science at the University of New Orleans in New Orleans, USA. He worked as a research

assistant, in the Department of Civil Engineering and Architecture of IST, on fluvial and environmental hydraulics, hydrodynamic numerical and physical modeling. During his doctoral program, he worked as a research assistant at the Department of Civil and Environmental Engineering of the University of New Orleans. He is currently a Post-Doctoral Researcher at the Department of Civil and Environmental Engineering of the University of New Orleans.



FABRICIO J. SUTILI

M. Sc. Degree in forestry at the Federal University of Santa Maria (UFSM), and a PhD degree at the Universität für Bodenkultur (BOKU), Vienna, Austria - Department of Civil Engineering and Natural Hazards, Institute of Soil Bioengineering and Landscape

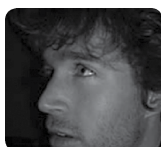
Construction (IBLB). He is currently professor at the Federal University of Santa Maria (UFSM). Areas of Interest: Ecological Restoration, Soil Bioengineering and Watershed Management.



HANS PETER RAUCH

Senior Lecturer, Post Doc in Soil-Bioengineering at the Universität für Bodenkultur (BOKU), Vienna - Austria. Expertise: soil bioengineering, semi-natural hydraulic engineering, water conservation, torrent and avalanche control.



**CLEMENS WEISSTEINER**

PhD-student at the Universität für Bodenkultur (BOKU), Vienna – Austria. Expertise: soil bioengineering and semi-natural river engineering.

**ANNA SERRA LLOBET**

Visiting scholar, University of California at Berkeley, Institute of Urban and Regional Development. Post-doctoral project: Floods, risk perception and land-use planning: a comparative study between the US and the EU (2011-). Ph.D. Environmental Sciences, Autonomous University of Barcelona, Spain. M.Sc. Environmental Sciences, Autonomous University of Barcelona, Spain. Intern at the Directorate General for the Environment, European Commission, Brussels. Areas of Current Research: Flood risk assessment and management strategies focusing on Mediterranean rivers and climate change influences on extreme events, and vulnerability analyses of human societies living in flood prone areas.

**PILAR BARRAQUETA EGEEA**

PhD in Natural Sciences from the University of Bremen, Germany (1981). Founding member of EKOS, Environmental Assessment and Research, environmental consultancy established in 1988. European managing director EECO Ecological Consulting SL since 1996. She works primarily in the environmental impact assessment of projects and strategic environmental assessment of land use and urban plans, as well as ecological restoration projects of various kinds. She belongs to several associations, such as: President of SALDROPO, Association for the study and protection of inland wetlands, Secretary of AEIP (Spanish Association of Landscape Engineering), Member of EFIB (European Federation of BioEngineering)

**DIOGO DE ABREU**

Director of the Center for Geographical Studies, University of Lisbon (CEG-UL). At present, with its team of 124 researchers, 43 of whom have PhDs, the CEG-UL is a reference in research and in the dissemination of geographical knowledge in Portugal.

According to European standards, it is considered to be a top quality research unit. Main interests: Modeling, Urban and Regional Planning (MOPT), Migration, Spaces and Societies.

**JOÃO CARLOS AZEVEDO**

President of the Portuguese Association for Landscape Ecology (APEP), and Professor at the Department of Environment and Natural Resources and Mountain Research Center (CIMO), based at the School of Agriculture of the Polytechnic Institute of Bragança, Ph.D.,

Forestry, Texas A&M University. Main Interests: Landscape ecology, sustainability in forested landscapes, nature conservation, sustainable short rotation forestry systems, modeling.

**FRANCISCO CASTRO REGO**

Professor at the Instituto Superior de Agronomia (ISA), Technical University of Lisbon, Portugal, and the Coordinator of the Baeta Neves Applied Ecology Research Center (CEABN), Lisbon. He received his PhD in Forestry, Wildlife and Range Management

from the University of Idaho, USA. His research has been focused primarily on fire ecology and management. He is the international coordinator of the EU project Fire Paradox and the representative of Portugal in the Committee of the Forests, their Products and Services Domain (EU-COST). Dr. Rego was Director of the Forest Research Station in Lisbon (1996-2000), Director of the Portuguese Forest Service (2005-2007), and a member of the Directive Council of the European Forest Institute since 1998, as well as its Vice-Chairman, and Chairman (2002-2004).





RUI CORTES

Professor and Vice-Director of the Center for the Research and Technology of Agro-Environmental and Biological Sciences (CITAB), at UTAD, Vila Real, Portugal, Vice-president and Portuguese delegate at the Iberian Centre for River Restoration (CIREF),

President of the Audit Committee of APENA.



JOSE MATOS SILVA

Professor at the Faculty of Engineering, The Catholic University of Portugal (UCP), Lisbon, Portugal, President of APENA - the Portuguese Association for Soil- and Water-Bioengineering, President of Real 21 - a non-profit NGO dedicated to the restoration

and preservation of Real River (1977 -). Member of EFIB - European Federation of Soil Bioengineering (2007 -), Counselor of the Tagus River Basin Management (2009 -). Author or co-author of more than 200 publications. Main Domains of Research: Hydrodynamics, River Hydraulics, Water Resources, Environmental Engineering, History of Hydraulics, Soil and Water-Bioengineering, Land Use Planning, Sustainable Development.



ABSTRACTS OF THE ACCEPTED POSTERS

1.1.P.1.14

O PARQUE FLORESTAL DE MONSANTO

A SUA EVOLUÇÃO HISTÓRICA E UM CONTRIBUTO PARA O SEU PLANO DE GESTÃO

**Teresa Grilo¹, Ana Luísa Soares², Sónia Talhé Azambuja² e
Cristina Gomes³**

¹ Aluna do Mestrado em Arquitetura Paisagista, Instituto Superior de Agronomia, Universidade Técnica de Lisboa, Tapada da Ajuda, 1349-017 Lisboa

² Centro de Ecologia Aplicada Professor Baeta Neves, Instituto Superior de Agronomia, Universidade Técnica de Lisboa, Tapada da Ajuda, 1349-017 Lisboa

³ CML Divisão Gestão do Parque Florestal Monsanto, Estrada do Barcal, Monte das Perdizes, 1500-068 Lisboa

O Parque Florestal de Monsanto é o maior Parque da cidade de Lisboa ocupando uma área de cerca de 1000 ha. A história regista, já em 1868, a intenção de criar um parque florestal na descarnada serra de Monsanto. Mas só nos anos 30 se inicia a sua obra, pelo ministro das obras públicas, engenheiro Duarte Pacheco, e pelo arquiteto Keil do Amaral, altura em que se fizeram as expropriações, datando as primeiras plantações de meados dos anos 40. Nos anos 90 foram inaugurados espaços como o parque do Alto da Serafina e o Parque Ecológico. No início do século XXI a cidade de Lisboa regista um valor médio de área de espaços verdes de 9,1 m²/hab, se não incluirmos o Parque de Monsanto, e de 26,8 m²/hab se o incluirmos (Soares e Castel-Branco, 2007). Este facto justifica a importância atribuída ao tema em estudo que para além de uma análise biofísica e histórica do Parque, pretende retratar as alterações ao longo dos tempos, uma vez que tem sido alvo de grande pressão urbanística. Como objetivo final pretende contribuir com considerações relevantes para a gestão do Parque, tendo em consideração o Plano de Gestão Florestal aprovado



pela Autoridade Florestal Nacional em 2012 e a realização de inquéritos aos utilizadores do parque, delineando desta forma diretrizes que pretendem contribuir para a transposição do Plano para a prática de gestão deste território e promoção da sua componente ecológica, estética e social.

Referência Bibliográfica:

Soares, A.L. e Castel-Branco, C., 2007. As Árvores da Cidade de Lisboa. In SILVA, J.S. (Ed.), Floresta e Sociedade, uma história em comum. Público/FLAD/LPN, Lisboa. Pp: 289-334

Palavras Chave: Parque Florestal de Monsanto; Keil do Amaral; Biodiversidade; Sustentabilidade; Recreio

2.2.P.1.47

AVALIAÇÃO DO POTENCIAL DE ESPÉCIES VEGETAIS PARA RECUPERAÇÃO DE VOÇOROCAS - BACIA DO RIO MARACUJÁ (OURO PRETO - MG, SUDESTE BRASIL)

Simone de Fátima C. Ribeiroa, Alessandra Rodrigues Kozovitsb, Mariangela Garcia Leitea

^a Departamento de Geologia/Escola de Minas/Universidade Federal de Ouro Preto - 35400-000 Ouro Preto - MG, Brasil

^b Departamento de Biodiversidade, Evolução e Meio Ambiente/Universidade Federal de Ouro Preto

O presente estudo foi desenvolvido em uma voçoroca (54.300 m²) bastante ativa. Neste local foram delimitados dois canteiros experimentais, um deles se encontra em uma área plana e úmida (C1) e o outro se localiza em área mais seca e íngreme (C2). Em novembro/11, mudas e estacas de sete espécies foram plantadas com o objetivo de acompanhar sua sobrevivência e crescimento nesse ambiente. Mudas de Croton urucuana, Eritrina falcata e Inga edulis, espécies mais adaptadas a umidade, foram plantadas no C1. No C2 foram plantadas mudas de *Eremanthus erythropappus*, *Psidium guajava*, *Vetiveria zizanioides*, e estacas de *Morus nigra*. Cada canteiro foi dividido em quatro quadrantes, foram plantadas cinco mudas de cada espécie por quadrante, totalizando vinte mudas. Pretende-se retirar amostras do solo contendo o sistema radicular das plantas sobreviventes para a realização de ensaios de tensão ao cisalhamento e inderbitzen, obtendo dados referentes

a resistência dessas plantas a movimentos de massa e ao escoamento superficial. Os resultados preliminares indicam *C. urucuana* como uma espécie promissora, ela foi a única a apresentar 100% de sobrevivência. Além disso, observações de campo indicam que as mudas, após o soterramento em um evento chuvoso, lançam raízes primárias em cerca de 7 dias, indicando que essa espécie parece ter rápido enraizamento e resistência ao soterramento. As estacas de *M. nigra* e mudas de *V. zizanioides* apresentaram, respectivamente, 60% e 40% de sobrevivência, resultados inferiores ao esperado. Experimentos em casa de vegetação também estão sendo conduzidos para elucidar melhor sobre o crescimento vegetativo de *C. urucuana*.

Palavras chave: Voçoroca, Croton urucuana, movimentos de massa, escoamento superficial.

3.2.P.2.73

AVALIAÇÃO DE ENRAIZAMENTO ADVENTÍCIO E REBROTE DE ESTACAS DE

Schinus terebinthifolius Rad. e *Leandra lacunosa* Cogn.

PARA APLICAÇÃO EM TÉCNICAS DE ENGENHARIA NATURAL.

Lelis, S. M¹; Kozovits, A. R¹; Leite, M. G. P¹; Sutili, F.².

¹Universidade Federal de Ouro Preto, Ouro Preto, MG;

²Universidade Federal de Santa Maria, Santa Maria, RS.

Este estudo visou contribuir com informações sobre as características biotécnicas de duas espécies nativas de uma área no entorno de voçorocas da região de Ouro Preto, Minas Gerais (MG), Sudeste do Brasil, com ênfase para a aplicação em técnicas de engenharia natural de contenção e ou estabilização de processos erosivos. Para tanto avaliou-se o potencial de enraizamento adventício e rebrote de duas espécies de ampla ocorrência na área: 40 estacas de cada espécie, obtidas do caule, com 12 cm de comprimento e diâmetro variando de 1,2 a 2,2 cm para *Leandra lacunosa* e de 0,7 a 1,5 para *Schinus molle* foram coletadas e colocadas a 9 cm de profundidade em fitocelas contendo areia. Após 75 dias em casa de vegetação com controle microclimático, foram avaliados a taxa de sobrevivência, número, comprimento e diâmetro de raízes e



brots das estacas. As estacas de *L. lacunosa* apresentaram 60% de sobrevivência, com uma média de 2,2 brotos com 2,1 cm de comprimento e 1,7 mm de diâmetro e um número médio de raízes de 0,1 com 0,2 cm de comprimento. As estacas de *S. molle* apresentaram 35% de sobrevivência com uma média de 0,8 brotos com 1,7 cm de comprimento e 1,1 mm de diâmetro e um número médio de raízes de 0,8 com 0,6 cm de comprimento. Resultados do brotamento e enraizamento demonstraram que as espécies não são adequadas para aplicação em técnicas de engenharia natural de contenção e ou estabilização de processos erosivos.

Palavras chaves: voçorocas, engenharia natural, rebrote

4.2.P.3.103

A NEW METHODOLOGY FOR CALCULATING SLOPE STABILITY FACTORS INCLUDING PLANT ROOT ANCHORAGE EFFECTS

Guillermo Tardío Cerrillo

Forestry engineer. Freelance, Madrid, Spain.

In traditional stability factor formulae, behaviour of the different elements involved (soil and reinforcements) are characterized by its position. Thus, all terms included in the numerator are assumed to have similar stress-strain behaviour.

Differences in behaviour between reinforcement and soil may be due to several reasons (i.e. different stiffness, different strain-stress curves, and etcetera).

The use of the same value of FS for all the elements is not correct because of a lack of stress-strain compatibility. The soil and roots reach their peak resistance at a very different strain level.

For reinforced soil structures it is important that the reinforcement (the roots) be “compatible” with the soil. This means that the long term design strength of the reinforcement (root strength) should be achieved at a total strain level corresponding to a strain in the soil matching peak soil strength. This is a necessary step for achieving strain compatibility in slope stability formulae. This is a requirement of the proposed

methodology.

Slip surface development in soil is a progressive phenomenon, especially in reinforced soil where reinforcements delay the formation of a surface in their vicinity or it may be overstressed locally thus greatly deforming or creeping locally.

As strain progresses, the soil deforms and the resistance contribution by the soil progressively drops further, increase in root reinforcement load, further deformations, even more sections approaching the residual strength, and so on until the whole sliding surface is ruled by soil residual resistance.

By using limit equilibrium methods is not possible to find local failures within the slope. Local stability factors can be worked out by using finite element analysis.

In the proposed methodology the former limitations are overcome.

5.2.P.4.49

TEMPORAL EVOLUTION OF LIVE AND WOODY ELEMENTS IN A SOIL BIO-ENGINEERING STRUCTURE

E. Guastini¹, L. Mazzanti², F. Preti¹

¹ Dipartimento di Economia, Ingegneria, Scienze e Tecnologie Agrarie e Forestali, Università di Firenze, Italia

² Unione dei Comuni Montani del Casentino, Via Roma 203 - 52013 Ponte a Poppi (AR), Italia

³ Dipartimento di Economia, Ingegneria, Scienze e Tecnologie Agrarie e Forestali, Università di Firenze, Italia

This study deals with surveys operated on crib walls in Tuscany, where *Salix alba* cuttings did not develop as expected from literature data.

After more than 10 years since realization and an initial very high survival rate, a few plants are yet alive among those put in place and the root strengthening is localized in the first 0.30 m just below the structure front face, while at further depth the detected root area ratio (R.A.R.) does not determine a noticeable increase in soil cohesion (Guastini et al., 2012).

Mortality curve in willow cuttings is comparable with growing

