GEOTECHNICAL SPECIAL PUBLICATION NO. 179



GeoCongress 2008

Characterization, Monitoring, and Modeling of GeoSystems

PROCEEDINGS OF SELECTED SESSIONS OF GEOCONGRESS 2008

EDITED BY
Akram N. Alshawabkeh
Krishna R. Reddy
Milind V. Khire

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GEOCONGRESS 2008

CHARACTERIZATION, MONITORING, AND MODELING OF GEOSYSTEMS

PROCEEDINGS OF SESSIONS OF GEOCONGRESS 2008

March 9–12, 2008
New Orleans, Louisiana

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EDITED BY
Akram N. Alshawabkeh
Krishna R. Reddy
Milind V. Khire

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Preface

Geo-engineers and geo-scientists are increasingly confronted by new challenges in protecting and preserving our environment and infrastructure. Innovative and emerging scientific concepts and technologies are always needed to address a wide range of complex geoenvironmental issues such as groundwater protection and remediation, management of waste disposal, sustainable development and mitigation against natural and man-made geohazards.

In 1995, ASCE organized a conference on "Geoenvironment 2000: Characterization, Containment, Remediation and Performance of Environmental Geotechnics" in New Orleans, Louisiana. This conference highlighted the role of geo-professionals and the wide range of geoenvironmental engineering challenges, such as the design, construction, and monitoring of containment facilities as well as engineering mitigation of environmental geo-hazards. In 1997, ASCE organized another specialty conference on "In Situ Remediation of the Geoenvironment," in Minneapolis, Minnesota.

Due to rapid industrialization, increased environmental awareness, and the complexity of tackling past unsafe waste disposal practices; geoenvironmental engineering has continued to evolve as a discipline that bridges between engineering and basic sciences to address geo-specific environmental problems. It was imperative to organize GeoCongress 2008, March 9-12, 2008, in New Orleans, Louisiana to highlight recent advances, new directions and opportunities for sustainable engineering to protect the environment and infrastructure.

The Congress attracted a significant number of papers and more than 400 were accepted. The papers were divided into three Geotechnical Special Publications (GSPs) that capture the multidisciplinary aspects and the challenges of the sustainability of the geoenvironment.

The first GSP, *Geotechnics of Waste Management and Remediation*, tackles the challenges of sustainability in remediation and waste management, and covers topics on new and conventional remediation technologies, design and operational aspects of bioreactor landfills, innovations in design and assessment of covers and liners, management of mining wastes, and recycle and reuse of waste materials.

The second GSP, *Geosustainability and Geohazard Mitigation*, tackles the challenges of sustainability in geotechnics, and covers topics on education, sustainable materials and infrastructure, risk-based analysis and design, and impacts and mitigation of geohazards.

The third GSP, *Characterization, Monitoring and Modeling of GeoSystems*, covers mechanical and chemical soil behavior, testing, and modeling. The GSP presents innovations on subsurface characterization and monitoring, characterization of rocks, problematic Soils and waste materials; and sensor technologies. Recent developments in numerical and computational geotechnics, emerging technologies, fate and transport modeling, uncertainty modeling, and micro- and environmental geo-mechanics are also covered in this GSP.

The paper review process was managed by the editors and Paper Review Board. The review board had a very active and essential role in reviewing papers, organizing the conference sessions, and making the GSPs possible. The editors sincerely appreciate the help and patience of the Review Board. The editors also appreciate the help of Ms. Sheana Singletary of ASCE for her help in managing paper submissions and dealing with the glitches of the database.

We hope that these GSPs will serve as valuable references to all working in geoengineering.

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