

Selected Papers from the Proceedings of Geo-Chicago 2016

GSP 270



Geo-Chicago 2016: Geotechnics for Sustainable Energy

ASCE

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Preface

Geo-engineers and geo-scientists have been playing a major role in providing, protecting, and preserving infrastructure and the environment. Many innovative technologies and practices are constantly being developed and implemented. Evolving global climate change and exploding world population are leading to major concerns such as extreme geohazards, increased environmental pollution, and rapid depletion of natural resources. These new challenges can be addressed with new and innovative concepts, materials, energy sources, technologies, and practices. Sustainability and resiliency have become essential in the development of new materials and infrastructure systems. *Geo-Chicago 2016: Sustainability, Energy, and the Environment* held in Chicago August 14-18, 2016, provided a unique opportunity to highlight recent advances, new directions, and opportunities for sustainable and resilient approaches to design and protect infrastructure and the environment.

The Geo-Chicago 2016 Conference attracted a significant amount of interest and in the end more than 350 papers were accepted for publication. The papers are divided into five Geotechnical Special Publications (GSPs) that capture the multidisciplinary aspects and challenges of sustainability and resiliency, energy and the geoenvironment.

The first GSP, *Sustainability and Resiliency in Geotechnical Engineering*, addresses major broad issues related to sustainability and resilience in geotechnical and geoenvironmental engineering, including carbon sequestration as well as characterization, analysis, monitoring, and response to geohazards and natural disasters, including earthquakes and landslides. Advances in emerging technologies and materials such as bio-mediated soils and nanomaterials are also presented.

The second GSP, *Geotechnics for Sustainable Energy*, tackles the new and innovative ways of storing and extracting energy in and from geotechnical media and structures such as shallow and deep ground, piles and foundations, and landfills. The second GSP also presents the challenges of the energy storage and extraction at the field and lab scales as well as its numerical and experimental modeling.

The third GSP, *Sustainable Geoenvironmental Systems*, addresses recent advances in landfill engineering and geosynthetics used for geoenvironmental systems, as well as advances in sustainable barrier materials and systems. The third GSP also presents studies into slopes, dikes, and embankment, the application of ground improvement in geoenvironmental applications, and the geoengineering of mine wastes and industrial byproducts.

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The fourth GSP, *Sustainable Materials and Resource Conservation*, describes the properties and applications of new, recycled, and residual materials, detailed/improved characterization of soils with laboratory and field testing methods, and effects of chemicals and other environmental factors on properties and behavior of soils. The fourth GSP also presents the approaches and use of modeling and simulations in geoengineering.

The fifth GSP, *Sustainable Waste Management and Remediation*, addresses various aspects of remediation, contaminated materials, containment, policy, and education. In addition, international perspectives are included to provide further context on challenges and innovations in geoenvironmental engineering on a global scale.

Following standards of practice of the Geo-Institute of the American Society of Civil Engineers, each paper published in these Geotechnical Special Publication (GSPs) was peer reviewed by at least two anonymous, qualified, technical reviewers (and in some cases three or four reviewers) and selected for publication by the proceedings editors. An advanced document management service was utilized in order to assure anonymity and maintain uniformity of standards. As such, the papers contained in these proceedings are eligible for discussion in the ASCE Journal of Geotechnical and Geoenvironmental Engineering and for ASCE awards.

The Editors

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Acknowledgments

The success of Geo-Chicago 2016 is credited to the session chairs and authors of the technical papers and also plenary session presenters for their valuable contributions to the geotechnical literature. The commendable quality of the Conference's technical content and these proceedings are also the result of the efforts of the hundreds of reviewers. We thank the session chairs, authors and reviewers for generously contributing their valuable time and expertise, in many cases, under time pressure and demanding deadlines.

The following individuals served as the conference program committee. They deserve special acknowledgment and recognition for their extraordinary efforts in making this Conference a reality and a resounding success:

- Conference Chair – Krishna R. Reddy, University of Illinois at Chicago
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The Editors sincerely appreciates the help and patience of Ms. Helen Cook and Mr. Brad Keelor of Geo-Institute of the ASCE for their help in managing the paper submissions and organization of the conference.

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

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