

PanAm Unsaturated Soils 2017

Plenary Papers

Papers from Sessions of the
Second Pan-American Conference
on Unsaturated Soils

Dallas, Texas
November 12–15, 2017

Edited by

Laureano R. Hoyos, Ph.D., P.E.
John S. McCartney, Ph.D., P.E.
Sandra L. Houston, Ph.D., D.GE



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PANAM UNSATURATED SOILS 2017

PLENARY PAPERS

SELECTED PAPERS FROM SESSIONS OF THE SECOND
PAN-AMERICAN CONFERENCE ON UNSATURATED SOILS

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Dallas, Texas

SPONSORED BY
International Society of Soil Mechanics and Geotechnical Engineering
The Geo-Institute of the
American Society of Civil Engineers

EDITED BY
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John S. McCartney, Ph.D., P.E.
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Preface

The Second Pan-American Conference on Unsaturated Soils (PanAm-UNSAT 2017) was held in Dallas, Texas, November 12-15, 2017, featuring the latest research advances and engineering-practice innovations in the area of Unsaturated Geotechnics, with a focus on characterization, modeling, design, construction, field performance and sustainability.

PanAm-UNSAT 2017 follows a now well-established series of regional and international conferences on Unsaturated Soils, bringing together researchers, practitioners, students and policy makers from around the world, particularly the Americas. The conference built upon the success of PanAm-UNSAT 2013 (First Pan-American Conference on Unsaturated Soils, Cartagena, Colombia), as well as that of previous conferences on unsaturated soils hosted in the United States, including UNSAT 2006 (Fourth International Conference on Unsaturated Soils, Carefree, Arizona) and EXPANSIVE'92 (Seventh International Conference on Expansive Soils, Dallas, Texas, 1992).

Proceedings of PanAm-UNSAT 2017 have been documented in four Geotechnical Special Publications (GSP) of ASCE including Volume 1: Plenary Session Papers; Volume 2: Fundamentals; Volume 3: Applications; and Volume 4: Swell-Shrink and Tropical Soils.

Current Volume 1 (Plenary Session Papers) consists of three sections:

Section I includes 4 papers documenting the invited Keynote Lectures delivered by Profs. Delwyn Fredlund, Ning Lu, Bernardo Caicedo and Tacio de Campos, respectively; and 2 more companion papers documenting the First Distinguished Pan American Lecture on Unsaturated Soils delivered by Prof. Sandra L. Houston.

Section II includes 6 papers documenting the invited Fredlund Symposium Lectures delivered by distinguished scholars in honor to the decades-long contribution of Prof. Delwyn G. Fredlund to the discipline of Unsaturated Geotechnics.

Section III includes 6 more papers documenting the invited State-of-the-Art and State-of-the-Practice Lectures delivered by distinguished researchers and experienced practitioners from the region.

Each paper was subject to rigorous technical review and received a minimum of two positive peer reviews before final acceptance by the conference technical committee.

Acknowledgments

The following individuals deserve special acknowledgment and recognition for their direct involvement and efforts in making this regional conference a success:

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The conference Program Committee would also like to acknowledge the officers of the TC106 Committee on Unsaturated Soils (ISSMGE), and all members of the Technical Advisory and International Technical Committees, who provided guidance and support during the early planning phases of the conference.

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PanAm-UNSAT 2017 Session Chairs

The conference Program Committee would also like to acknowledge the conference Session Chairs, who guided authors and reviewers through the draft and final phases of paper submission and review. In most cases, these chairs also served as on-site moderators during the conference itself.

01/ Dynamic Behavior of Unsaturated Soils, part I

Majid Ghayoomi, Ph.D., A.M.ASCE, University of New Hampshire

02/ Dynamic Behavior of Unsaturated Soils, part II

Nadarajah Ravichandran, Ph.D., M.ASCE, Clemson University
 Laureano R. Hoyos, Ph.D., P.E., M.G-I, University of Texas at Arlington

03/ Expansive Soils and Volume Change, Part I

Rifat Bulut, Ph.D., M.ASCE, Oklahoma State University

04/ Expansive Soils and Volume Change, Part II

Jairo E. Yepes, Ph.D., Universidad Santo Tomás, Bogotá, Colombia
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05/ Expansive Soils and Volume Change, Part III

Iraj Noorany, Ph.D., P.E., G.E., F.ASCE, Noorany Geotechnical

06/ Pore Fluid Retention Behavior, Part I

William J. Likos, Ph.D., M.ASCE, University of Wisconsin, Madison
Idil Deniz Akin, Ph.D., A.M.ASCE, Washington State University

07/ Pore Fluid Retention Behavior, Part II

Corrie Walton-Macaulay, Ph.D., P.E., M.ASCE, Bucknell University

08/ Hydraulic Behavior, Part I

Leonardo D. Rivera, METER Group

09/ Hydraulic Behavior, Part II

Leonardo D. Rivera, METER Group

10/ Shear Strength Behavior

Ali Khosravi, Ph.D., Aff.M.ASCE, Sharif University of Technology

11/ Innovations in Testing, Part I

Morteza Khorshidi, Ph.D., Aff.M.ASCE, Geosyntec Consultants
Xin Kang, Ph.D., ACI, ASTM, A.M.ASCE, Hunan University

12/ Innovations in Testing, Part II

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13/ Innovations in Testing, Part III

Morteza Khorshidi, Ph.D., Aff.M.ASCE, Geosyntec Consultants
Xin Kang, Ph.D., ACI, ASTM, A.M.ASCE, Hunan University

14/ Field Applications of Unsaturated Soils

Gerald A. Miller, Ph.D., P.E., M.ASCE, University of Oklahoma

15/ Stability of Unsaturated Slopes, Part I

Navid H. Jafari, Ph.D., A.M.ASCE, Louisiana State University

16/ Stability of Unsaturated Slopes, Part II

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17/ Numerical Modeling: Flow and Deformation, Part I

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18/ Numerical Modeling: Flow and Deformation, Part II

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19/ Numerical Modeling: Coupled Processes

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20/ Foundations on Expansive Soils

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21/ Expansive Soils: Mitigation

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22/ Expansive Soils: Modeling

Xinbao Yu, Ph.D., P.E., M.ASCE, University of Texas-Arlington

23/ Pipeline and Transportation Structures in Unsaturated SoilsClaudia E. Zapata, Ph.D., A.M.ASCE, Arizona State University
Mohammad Sadik Khan, Ph.D., P.E., M.ASCE, Jackson State University***24/ Modeling of Cracked Soils and Effects of Cracking***

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25/ Constitutive Modeling: Micro to Macro

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26/ Climate Effects and Permafrost

Farshid Vahedifard, Ph.D., P.E., M.ASCE, Mississippi State University

27/ Energy Geotechnics, Bio-Geo, and Sustainability

John S. McCartney, Ph.D., P.E., M.ASCE, University of California, San Diego

PanAm-UNSAT 2017 Draft Paper Reviewers

Finally, the Program Committee would also like to acknowledge those who contributed to the conference by serving as the primary reviewers of draft papers. Their efforts in providing careful, thorough reviews of each submission form the backbone of quality assurance, providing organizers the confidence that conference content would represent the best of current thinking in the field, and allowing these Proceedings to be published as a multi-volume Geotechnical Special Publication (GSP).

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