CLAUDIA E. ZAPATA, M.S., Ph.D.

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EDUCATION

Ph.D., Arizona State University, Tempe, AZ, Geo-Environmental Engineering **1999**
Major: Geotechnical Engineering; Minor: Environmental Engineering
Ph.D. Dissertation: Uncertainty sin Soil-Water Characteristic Curve and Impacts on Unsaturated Shear Strength Predictions.
M.S.E., Arizona State University, Tempe, AZ, Geotechnical Engineering **1996**
B.S., Universidad Nacional de Colombia, Manizales, Colombia **1988**

ACADEMIC APPOINTMENTS

Associate Director, National Center for Infrastructure Transformation, US Department of Transportation **2023-Present**
Deputy Director, Center for Bio-mediated and Bio-Inspired Geotechnics, Arizona State University, Tempe, AZ. **2015-Present**
Associate Professor, School of Sustainable Engineering and the Built Environment, ASU, Tempe, AZ. **2014-Present**
Assistant Professor, Geotechnical Engineering, Department of Civil and Environmental Engineering, ASU, Tempe, AZ. **2006-2013**
Faculty Research Associate, Advanced Pavement Group, Department of Civil and Environmental Engineering, Arizona State University, Tempe, AZ. **2000 – 2006**
Research Specialist, Sr., Advanced Pavement Group, Department of Civil and Environmental Engineering, Arizona State University, Tempe, AZ. **1999 – 2000**
Graduate Research Assistant, Geotechnical Engineering, Department of Civil and Environmental Engineering, Arizona State University, Tempe, AZ. **1995 – 1999**
Graduate Research Assistant, Geotechnical Engineering, Department of Civil and Environmental Engineering, Arizona State University, Tempe, AZ. **1991 – 1992**

INDUSTRY and CONSULTING EXPERIENCE

ZW Consultants – Consultant on environmental effects and unsaturated soil behavior on transportation geotechnics field **2015-Present**
Department of Defense, ERDC - Expert Panel member: Advisor to the DoD on upgrading their pavement design procedures. **2014**
Louisiana State Department of Transportation – Consultant: implementation of environmental models into pavement design procedures. **2011-2013**
Applied Research Associates, Inc. – Consultant: Mississippi DOT Project: AASHTO 2002 Pavement Design Guide– Phase II **2011-2012**
US Army Corps of Engineers – Consultant: evaluation of airfield design procedures. **2010**
Associate Geotechnical Engineer, AMEC, Earth & Environmental. Tempe, AZ – Consultant on-call **2008-2013**
Parsons International, Consultant on-call: geotechnical evaluation of road damages in the Middle East. **2007-2012**
Engineering Consultant, Tomas Shuk Engineers Inc. Bogota, Colombia. **1993-1995**
Intern Research Assistant, Project for Sergent, Hauskins & Beckwith & Arizona State University, Tempe, AZ. **1990-1991**
Engineering Consultant, AQUATERRA, Engineering Consultants, Ltd. Manizales, Colombia. **1988-1989**
Engineering Assistant, Hydroelectric Power Station of Caldas, Colombia (CHEC) & Universidad Nacional de Colombia. Manizales, Colombia. **1987-1988**
Engineering and Geology Assistant, Colombian Geological Survey (INGEOMINAS). Manizales, Colombia. **1986-1988**

HONORIFIC MENTIONS AND AWARDS

Awarded with the 2025 **Carl Monismith Lecture Award** for outstanding research contributions in Pavement Engineering. ASCE **2025**
Awarded with the 12th Annual Arizona Higher Education Award. **Dr. William Yslas Velez, Science, Technology, Engineering, and Mathematics (STEM) Award.** The Pete C. Garcia Victoria Foundation. Sept. 2021. These awards honor and recognize the contributions of Arizona's scholars and leaders in higher education institutions, who champion the recruitment and degree completion of Latino students. **2021**
Nominated to the ASU Graduate College Outstanding Faculty Mentor Award **2020**
Nominated as a Badass Women of ASU by the ASU Women's Coalition: "She stands up against that silent and constant pressure in STEM to defer to the straight White old men and what they want, what they think, and what they value. She does this over and over and over and over." **2020**
Ira A Fulton School of Engineering Top 5% Teaching Award. Arizona State University **2019**
Nominated to the Faculty Women Association (FWA) 2019 Outstanding Faculty Mentor Award **2019**
Nomination to the Excellence in Diversity and Inclusion Award. Committee for Campus Inclusion, Arizona State University **2015**

Community Service Award for "making significant contributions to the advancement of the pavement/materials technology and programs in Arizona" – Academia award from the Pavement/Materials conference committee. **Nov 2011**

Senior Sustainability Scientist. Global Institute of Sustainability. Honorific designation awarded for her "…achievements in sustainability-related research". **May 2011**

Honors Disciplinary Faculty, ASU Barrett Honors College, for "her outstanding contributions and commitment of time to the honors students". **2006-Present**

Teaching Award from the Office of the Vice-President for Student Affairs at ASU. "Leader, mentor, and a person who has contributed in a significant way to the success of ASU students" **Nov. 2004**

PUBLICATIONS

Abstracts

1. Gaspard, K., Zhang, Z., Gautreau, G. Hanifa, K. Zapata, C. and Abufarsakh, M. (2018). Modeling the In-situ Seasonal Variation Potential of Resilient Modulus in Subgrade Soils. Proc. of the 97th Transportation Research Board annual meeting, Jan. 7-11, 2018, Washington DC.

Articles in National Magazines

1. Zapata, C.E.* and Houston, W.N. (2009). Application of Unsaturated Soil Mechanics to Pavement Subgrade Design, *Geo-Strata*, Geo-Institute, American Society of Civil Engineers, May/June Issue. 3 pgs.
2. Darter, M.I., Mallela, J.*, Titus-Glover, L., Rao, C., Larson, G., Gotlig, A., Von Quintus, H., Khazanovich, L., Witczak, M., El-Basyouny, M., **El-Badawy, S., Zborowski, A.** and Zapata, C. (2006). *Research Results Digest 308: Changes to the Mechanistic-Empirical Pavement Design Guide Software through Version 0.*900, National Cooperative Highway Research Program, Transportation Research Board of the National Academies, September 2006. 22 pgs.

Book Co-Edited

1. Miller, G.A., Zapata, C.E., Houston, S.L. and Fredlund, D.G. (eds). (2006). *Unsaturated Soils. Geotechnical Special Publication No. 147*. The Geo-Institute of the American Society of Civil Engineers. pp. 2581. Also, Proc. of the Fourth Int. Conf. on Unsaturated Soils. April 2-6, Carefree, AZ. Zapata's contribution: 30%

Book Chapters Published

1. Jiang, Y., Ullah, S. Fan, X., Zapata, C.E. and Yu, X. (2023). Analyses of Frost Susceptible Flexible Pavement Adaption for Climate Change. Geo-Risk 2023 Conference, American Society of Civil Engineers, Arlington, VA, July 23-26, 2023, pp. 156-165.
2. Olaiz, A.H., Zapata, C.E. and Soltanpour, Y. (2023). A Bayesian Forecast Framework for Climatic Parameters in Geotechnical Modeling. Geo-Risk 2023 Conference, American Society of Civil Engineers, Arlington, VA, July 23-26, 2023, pp. 88-97.
3. Salour, F. Erlingsson, S. and Zapata, C.E. (2014). Chapter 107. Resilient Modulus Modeling of Unsaturated Subgrade Soils with Matric Suction Control. Asphalt Pavements. Kim, Y.R. (editor). International Society for Asphalt Pavements (ISAP). CRC Press 2014, Print ISBN: 978-1-138-02693-3, pp. 1145-1154.
4. **Pedarla, A.,** Puppala, A.J., Hoyos, L.R., Vanapalli, S.K., and Zapata, C.E. (2012). SWRC Modelling Framework for Evaluating Volume Change Behavior of Expansive Soils. In: Unsaturated Soils: Research and Applications. DOI 10.1007/978-3-642-31116-1_30, pp. 221-228.

Refereed Conference Publications

1. Adegoke, A.H, Kashour, Y, Alothman, S. Zapata, C.E., and Salifu, Emmanuel (2025). Influence of Fungal Mycelium on Desiccation Cracking in Expansive Soils. Submitted to the First International Conference on Bio-Mediated and Bio-Inspired Geotechnics, Tempe, AZ, May 2025. Accepted.
2. Alothman, S., Kavazanjian, E. and Zapata, C.E. (2025). Preliminary Investigation of the Effects of EICP and $CaCl_2$ Treatments on Compaction and Unconfined Compression Strength of Sandy Soil. First International Conference on Bio-Mediated and Bio-Inspired Geotechnics, Tempe, AZ, May 2025. ICBBG. Accepted.
3. Jain, S., Kavazanjian, E. and Zapata, C.E. (xx). Effect of EICP Treatment on Erosion Resistance and Strength of a Clayey Sand Material. First International Conference on Bio-Mediated and Bio-Inspired Geotechnics. Accepted.
4. Jiang, Y., Alajlan, Z., Zapata, C.E. and Yu, Xiong (Bill). (2024). Multiphysics simulation of the effects of wicking geotextile on mitigating frost effects on cold region pavement. Transportation Research Board Meeting Proceedings, Washington DC, January 6-9, 2024.
5. Nassiri, S., Zapata, C.E. and Mahabadi, N. (2023). Evolution of Water Retention Characteristics in Bio-Geochemically Altered Unsaturated Soils: A Pore-Scale Study. Eight Int. Conf. on Unsaturated Soils, Milos, Greece, May 2-5, 2023, E3S Web of Conferences 382, 18004 (2023).
6. Olaiz, A.H. and Zapata, C.E. (2023). Climate-Driven Soil Suction Variation using a Natural-Order Fourier Series Approach. Eight Int. Conf. on Unsaturated Soils, UNSAT Milos, Greece, May 2-5, 2023, E3S Web of Conferences 382, 22002 (2023).
7. Olaiz, A.H., Houston, S.L., Zapata, C.E. and Mosawi, M. (2023). Suction-Volume Change Indices for Natural and Recompacted Clay -Soils. Proc. of 2023 Geo-Congress: Geotechnical Systems from Pore-Scale to City-Scale, ASCE, Los Angeles, CA, March 26-29, pp. 681-692.

8. Larson, J., Zapata, C.E. and Kavazanjian, E. (2022). Connecting Research to the Broader Community: Developing and Implementing a Graduate Course Across an Engineering Research Center's Partner Universities. American Society for Engineering Education (ASEE) 2022 annual conference and exposition, Minneapolis, MN, June 26-29, pp. 1-7, https://peer.asee.org/41901.
9. Kelly, R., Indraratna, B., Powrie, W., Zapata, C.E., Kikuchi, Y., and Gomes Correia, A. (2022). State of the Art in Transportation Geotechnics. In Proc. of the 20th Int. Conference on Soil Mechanics and Geotechnical Engineering, Sydney 2022, pp. 1-52. ***Invited paper and keynote***.
10. Stallings Young, E.G., Zapata, C.E. and van Paassen, L.A. (2022). Experimental Investigation of Microbial Induced Desaturation and Precipitation (MIDP) in a Layered Granular Soil System. In Proc. of the 2022 Geo-Congress, ASCE. GSP 331, https://doi.org/10.1061/9780784484012.036, March 20-23, 2022, pp. 347-355.
11. **Stallings Young, E.G.***, Zapata, C.E. and van Paassen, L. (2020). Unsaturated Fluid Flow through Granular Soils Treated with Microbial Induced Desaturation and Precipitation. In *Proceedings of the 4th European Conference on Unsaturated Soils (E-UNSAT 2020) Online Conference*, 195, 05003 (2020), October 19-21st, 2020, DOI: https://doi.org/10.1051/e3sconf/202019505003
12. Larson, J., Barnard, W., Chandler, J., O'Donnell, M., Savenye, W. and Zapata, C.E. (2020). Moving Beyond Technical Skills: Fostering the Development of Essential Skills Needed for a Successful Career in Engineering. In *Proceedings of the ASCE Geo-Congress 2020: Geotechnical Earthquake Engineering and Special Topics*, GSP 318, ISBN (PDF): 9780784482810, Hambleton, J.P., Makhnenko, R. and Budge, A.S (eds.), Feb. 25-28, 2020, Minneapolis, Minnesota, pp. 694-701
13. Vann, J.D., Olaiz, A.H., Morgan, S. and Zapata, C.E. (2019). A Practical Approach to a Reliability-Based Stability Evaluation of Precariously Balanced Granite Boulders. In *Proceedings of the 53rd U.S. Rock Mechanics/Geomechanics Symposium*, Brooklyn, United States, Jun 23-26, 2019, pp. 1-15.
14. Savenye, W., Larson, J., Zapata, C., Kavazanjian, E., Elwood, K., Barnard, W., O'Donnell, M., Chandler, J., Saenz, D., **Woolley, M.,** Van Paassen, L., Bronzer, C., DeJong, J. & Martinez, A. (2018). Building and Evaluating Education and Outreach Programs for an NSF Engineering Research Center, the Center for Bio-mediated and Bio-inspired Geotechnics (CBBG). In Proceedings of EdMedia: World Conference on Educational Media and Technology. Amsterdam, Netherlands: Association for the Advancement of Computing in Education (AACE). https://www.learntechlib.org/primary/p/184300/, pp. 966-971.
15. Zapata, C.E. (2018). Empirical Approach for the Use of Unsaturated Soil Mechanics in Pavement Design. *Geotechnical Special Publication, Proceedings of the Second Pan-American Conference on Unsaturated Soils*. Nov. 11-14, 2017, Dallas, Texas. DOI: 10.1061/9780784481677.008, GSP 300, pp. 149-173. ***Invited paper and featured presentation.***
16. **Thirthar Palanivelu, P.*** and Zapata C.E. (2018). Assessment of Cary and Zapata Suction Based Model for Prediction of Resilient Modulus in Fine Grained Subgrade Soils. *Geotechnical Special Publication, Proceedings of the Second Pan-American Conference on Unsaturated Soils*. Nov. 11-14, 2017, Dallas, Texas. DOI: 10.1061/9780784481684.053, GSP 301, pp. 523-532.
17. **Elwood, K.***, Savenye, W., Jordan, M.E., Larson, J., and Zapata, C.E. (2018). Design Thinking: A New Construct for Educators. Proceedings of the Association for Educational Communications and Technology, Las Vegas, NV, Vol. 1, 43-52.
18. **Thirthar Palanivelu, P.** and Zapata, C.E. (2017). Evaluation of a Resilient Modulus Model for Unsaturated Soil Conditions. In Proc. of the 10th Int. Conf. on the Bearing Capacity of Roads, Railways and Airfields, BCRRA 2017. June 2017, Athens, Greece. pp. 3-10.
19. Larson, J.*, Savenye, W., Zapata, C.E. and Kavazanjian, E. (2017). Implementation of an Introductory Module on Biogeotechnics in a Freshman Engineering Course. In Proceedings of the 2017 American Society of Engineering Education Annual Conference and Exposition, Columbus, OH, June 25-28, 2017, pp. 1-19.
20. **Dalal, M.***, Larson, J., Zapata, C. Savenye, W., Hamdan, N. and Kavazanjian, E. (2017). An Interdisciplinary Approach to Developing an Undergraduate Module on Biogeotechnical Engineering. In *Proceedings of Society for Information Technology & Teacher Education Int. Conf. 2017*. Chesapeake, VA: Association for the Advancement of Computing in Education (AACE). pp. 2074-2079.
21. Lu, Y.* and Zapata, C.E. (2016). Temperature Effects on the Unsaturated Hydraulic Properties of Two Fine-Grained Soils and Their Influence on Moisture Movement under an Airfield Test Facility. Proceedings of the 2016 Geotechnical and Structural Engineering Congress, ASCE, Feb. 14-17, Phoenix, AZ, pp. 569-583.
22. Gowda, R.P.C.* and Zapata, C.E. (2016). Effect of Bagasse Fiber on the Properties of Compressed Cement Stabilized Earth Blocks. Proceedings of the 2016 Geotechnical and Structural Engineering Congress, ASCE, Feb. 14-17, Phoenix, AZ, pp. 1435-1449.
23. **Palanivelu, P.T.*,** Zapata, C.E. and Underwood, S. (2016). Effect of As-Compacted Moisture Content and Density on Pavement Performance in Different Climatic Regimes. Proceedings of the 2016 Geotechnical and Structural Engineering Congress, ASCE, Feb. 14-17, Phoenix, AZ, pp. 1303-1316.
24. Abbaszadeh, S. ∞*, Houston, S.L. and Zapata, C.E. (2016). Effect of Desiccation Cracking on Swell and Swell Pressure of Expansive Clay. Proceedings of the 2016 Geotechnical and Structural Engineering Congress, ASCE, Feb. 14-17, Phoenix, AZ, pp. 2054-2065.
25. Rosenbalm, D. ∞* and Zapata, C.E. (2015). Stochastic Solution to the Subgrade Resilient Modulus: Monte Carlo Approach. Proceedings of the XV Pan-American Conference on Soil Mechanics and Geotechnical Engineering, November 15-18. Buenos Aires, Argentina, pp. 314-321.
26. **Ornelas, A**.*, Houston, S., Savenye, W., Zapata, C.E., Ramirez, E. and Corral, A. (2015). Disciplinary Diversity in the Development of Geotechnical Engineering Undergraduate Education Materials. 2015 International Foundations Congress and Equipment Expo (IFCEE), pp. 2161-2168. doi: 10.1061/9780784479087.200

27. Pedarla, A. ∞*, Puppala, A., Hoyos, L., Zapata, C.E. and Chittoori, B. (2014). Study of SWRC Modeling Parameters with Variation in Swelling Behavior and Mineralogy of Four Compacted Expansive Clays. Unsaturated Soils: Research and Applications - Proceedings of the 6th International Conference on Unsaturated Soils, UNSAT 2014, v 2, pp. 951-957.
28. **Ornelas, A., Sadauskas, J**., Houston, S., Savenye, W.C., **Ramirez, E**. and Zapata, C.E. (2013). An Engineering and Educational Technology Team Approach to Introducing New Unsaturated Soils Mechanics Material into Introductory Undergraduate Geotechnical Engineering Courses. Proceedings of the 120th American Society for Engineering Education (ASEE) annual conference. June 2013, Atlanta, GA. pp. 1-24.
29. **Rosenbalm, D**.C. and Zapata, C.E. (2013). Incorporation of the Soil-Water Characteristic Curve Hysteresis in Pavement Design. *Advances in Unsaturated Soils*. Caycedo et al. (eds). *Proceedings of the First Pan-American Conference on Unsaturated Soils*, ASCE, Cartagena, Colombia, February 20-22, 2013, Taylor & Francis Group, pp. 461-467.
30. **Bani Hashem, E.*** and Zapata, C.E. (2013). Enhancement of the Permanent Deformation Model for Unbound Materials Used by DARWin-ME. Transportation Research Board annual meeting, January 2012. Annual Meeting DVD. Student participation: 50%
31. **Kuna, B.***, Walsh, K., Houston, S.L., Zapata, C.E. and Welfert, B. (2013). Full Scale Test of Periodic Irrigation Infiltration in a Cracked and Intact Clay Slope. *GeoCongress 2013 Proceedings*, ASCE, San Diego, CA, March 2013, pp. 828-837.
32. **Rosenbalm, D.C.*** and Zapata, C.E. (2012). Incorporating Stochastic Evaluation in the Estimation of Soil Resilient Modulus. In *GeoCongress 2012 Proceedings, Geotechnical Special Publication 225*, ASCE, Oakland, CA, March 2012, pp. 1458-1467.
33. **Pedarla, A.*,** Puppala, A.J., **Chittoori, B.**, Hoyos, L.R., Zapata, C.E. and Houston, S.L. (2012). Influence of Mineral Montmorillonite on Soil Suction Modeling Parameters. In *GeoCongress 2012 Proceedings, Geotechnical Special Publication 225*, ASCE, Oakland, CA, March 2012, pp. 1126-1135.
34. **Cary, C.** and Zapata, C. (2010). Feasibility of a New Resilient Modulus Predictive Equation for Unsaturated Unbound Materials. *Proceedings of the 2nd International Conference on Transport Infrastructures*, Sao Paulo, Brazil, 4-6 August, 2010, pp. 147-156. ***Awarded one of the best three papers in conference***.
35. **Abbaszadeh, M**.*, Houston, S., and Zapata, C.E., Houston, W., Welfert, B. and Walsh, K. (2010). Laboratory Determination of Soil-Water Characteristic Curves for Cracked Soil. *Proceedings of the International Conference for Unsaturated Soils*, Barcelona, Spain, September 2010. pp. 409-415.
36. **Cary, C.** and Zapata, C.E. (2009). Resilient Modulus Testing for Unsaturated Unbound Materials. Transportation Research Board annual meeting, January 2009. Annual Meeting DVD.
37. **Arab**, **M.G**.*, Zapata, C.E. and Marinho, F.A.M. (2009). Using MEMS based RH Sensor to Measure High Total Suction. 17th International Conference on Soil Mechanics & Geotechnical Engineering. Alexandria, Egypt, Vol. 3, pp. 1881-1884.
38. Zapata, C.E. (2009). Considerations of Climate in the New AASHTO Mechanistic Empirical-Pavement Design Guide. Transportation Research Board annual meeting, January 2009. Annual Meeting DVD.
39. **Cary, C.** and Zapata, C.E. (2009). Evaluating the Utility of Existing Pavement Management System State Deflection Data for Use in the Implementation of the Mechanistic Empirical-Pavement Design Guide for Arizona. Transportation Research Board annual meeting, January 2009. Annual Meeting DVD. Student participation: 50%
40. Zapata, C. E. and **Cary, C**. (2009). A New Generation of Resilient Modulus Characterization of Unbound Materials. *Contemporary Topics in Ground Modification, Problem Soils, and Geo-Support. Geotechnical Special Publication No. 187:* Selected papers from the 2009 Int. Foundations Congress and Equipment Expo. ASCE. Orlando, Florida, March 15-19, 2009. pp. 377-384. Student participation: 50%
41. Perera, Y.Y., Zapata, C.E., Houston, W.N. and Houston, S.L. (2007). Prediction of Soil-Water Characteristic Curves (SWCC) of Granular and Fine Grained Soils. In *Proceedings of the First Sri Lankan Geotechnical Society International Conference on Soil and Rock Engineering*, Colombo, Sri Lanka, August 6-11, 2007. CD-ROM.
42. El-Basyouny, M., Witczak, M.W. and Zapata, C.E. (2007). Development of Asphalt Concrete Rutting Model Using Permanent Strain Database. *Transportation Research Board 86th Annual Meeting CD-ROM*, National Research Council, Washington D.C. (Paper accepted also for publication in the Transportation Research Record, J. of the TRB but pulled out for revision).
43. Zapata, C.E., Houston, S.L., Houston, W.N., and **Dye, H.** (2006). Expansion Index and Its Relationship with Other Index Properties. *Unsaturated Soils. Geotechnical Special Publication No. 147*. Also in Miller, et al. (eds.), *Proceedings of the Fourth International Conference on Unsaturated Soils*, April 2-6, Carefree, AZ. pp. 2133-2137.
44. **Dye, H.,** Zapata, C.E. and Houston, S. (2006). Geotechnical Evaluation of the Design of Post-Tensioned Slabs on Expansive Soils Using the PTI Third Edition Procedure for Arizona Conditions. *Unsaturated Soils. Geotechnical Special Publication No. 147*. Also in Miller, et al. (eds.), *Proc. of the Fourth International Conference on Unsaturated Soils*, April 2-6, Carefree, AZ. pp. 355-366.
45. Houston, W.N., **Dye, H.B**., Zapata, C.E., and **Perera, Y.Y**. (2006). Determination of SWCC Using One Point Suction Measurement and Standard Curves. *Unsaturated Soils. Geotechnical Special Publication No. 147*. Also in Miller, et al. (eds.), *Proceedings of the Fourth International Conference on Unsaturated Soils*, April 2-6, Carefree, AZ. pp. 1482-1493.
46. **Raghavendra, S**., Zapata, C.E., Mirza, M.W., Houston, W. and Witczak, M.W. (2006). Verification of the Rate of Asphalt Mix Aging Simulated by AASHTO PP2-99 Protocol. *Transportation Research Board 85th Annual Meeting CD-ROM*, National Research Council, Washington D.C.
47. **Perera, Y.Y.,** Zapata, C.E., Houston, W.N., and Houston, S.L. (2005). Prediction of the Soil-Water Characteristic Curve Based on Grain-Size Distribution and Index Properties. In E.M. Rathje (ed.), *Geotechnical Special Publications 130-142 & GRI-18*;

Proceedings of the Geo-Frontiers 2005 Congress, Jan. 24-26, Austin, Texas; ASCE Geo-Institute and Geosynthetic Materials Association of the Industrial Fabrics Association International Geosynthetic Institute. CD-ROM, 49-60.

48. **Perera, Y.Y.,** Zapata, C.E., Houston, W.N., and Houston, S.L. (2004b). Moisture Equilibria beneath Highway Pavements, Transportation Research Board 83rd Annual Meeting CD-ROM, National Research Council, Washington D.C. Student participation: 30%; Zapata's contribution: 30%
49. **Perera, Y.Y**., Zapata, C.E., Houston, W.N., and Houston, S.L. (2004a). Long-Term Moisture Conditions under Highway Pavements. In M.K. Yegian & E. Kavazanjian, (eds.), *Geotechnical Special Publication No. 126, Geotechnical Engineering for Transportation Projects*, ASCE Geo-Institute. Los Angeles, CA, Vol. 1, pp. 1132-1143. Also, in *Proc. of Geo-Trans 2004,* July 27-31. Student participation: 30%; Zapata's contribution: 30%
50. Zapata, C.E., Houston, W.N., Houston, S.L., and Walsh, K.D. (2000). Soil-Water Characteristic Curve Variability. In C.D. Shackelford, S.L. Houston, & N-Y Chang (eds), *Advances in Unsaturated Geotechnics. Geotechnical Special Publication No. 99*. Also, in *Proc. of Sessions of Geo-Denver 2000*, August 5-8, 2000, Denver: ASCE Geo-Institute. pp. 84-124.
51. Houston, W., Houston, S., Zapata, C.E., **Manepally, C**. and Lawrence, C. (1999). Influence of Compressibility on Use and Interpretation of Soil-Water Characteristic Curve. In *Proceedings of the XI Pan-American Conference on Soil Mechanics and Geotechnical Engineering*. August 8-12, 1999. Foz do Iguassu, Brazil: International Society for Soil Mechanics and Geotechnical Engineering. pp. 947-954.

Technical Reports

1. Kavazanjian, E. and Zapata, C. E. (2024). Center for Bio-mediated and Bio-inspired Geotechnics Engineering Research Center, Eight Annual Report, Tempe, AZ.
2. Kavazanjian, E. and Zapata, C. E. (2023). Center for Bio-mediated and Bio-inspired Geotechnics Engineering Research Center, Eight Annual Report, Tempe, AZ.
3. Kavazanjian, E. and Zapata, C. E. (2022). Center for Bio-mediated and Bio-inspired Geotechnics Engineering Research Center, Seventh Annual Report, Tempe, AZ.
4. Kavazanjian, E. and Zapata, C. E. (2021). Center for Bio-mediated and Bio-inspired Geotechnics Engineering Research Center, Sixth Annual Report, Tempe, AZ.
5. Kavazanjian, E. and Zapata, C. E. (2020). Center for Bio-mediated and Bio-inspired Geotechnics Engineering Research Center, Fifth Annual Report, Tempe, AZ.
6. Kavazanjian, E. and Zapata, Claudia E. (2019). Center for Bio-mediated and Bio-inspired Geotechnics Engineering Research Center, Fourth Annual Report, Tempe, AZ.
7. Zapata, C.E., Yu, B., Olaiz, A. Mosawi, M. and Dong, S. (2019). Proposed Enhancements to Pavement ME Design: Improved Consideration of the Influence of Subgrade Soils Susceptible to Shrink/Swell and/or Frost Heave on Pavement Performance, Interim report for Project NCHRP 01-59, The National Cooperative Highway Research Program (NCHRP), Transportation Research Board of The National Academies of Sciences, Engineering, and Medicine, Tempe, AZ
8. Kavazanjian, E. and Zapata, Claudia E. (2018). Center for Bio-mediated and Bio-inspired Geotechnics Engineering Research Center, Third Annual Report, Tempe, AZ.
9. Kavazanjian, E. and Zapata, Claudia E. (2017). Center for Bio-mediated and Bio-inspired Geotechnics Engineering Research Center, *Second Annual Report*, Tempe, AZ.
10. Zapata, C.E., Palanivelu, P.T., Lu, Y., Contreras, J. and Gowda, R.P.C. (2017). Investigation of Subgrade Moisture Flow in an Airfield Pavement System. Federal Aviation Administration. Research Project No. 13-G-008 Final Report. Tempe, AZ.
11. Kavazanjian, E. and Zapata, C.E. (2016). Center for Bio-mediated and Bio-inspired Geotechnics Engineering Research Center, *First Annual Report*, Tempe, AZ.
12. Zapata, C.E. and **Cary, C.E.** (2012). Unsaturated Soil Modeling for Military Airfield Pavement Design. A Feasibility Study. Final Report to U.S. Air Force and Tigerbrain Inc. (subsidiary). Tempe, AZ.
13. Zapata, C.E. and **Cary, C.E**. (2012). Integrating the National Database Subgrade Soil-Water Characteristic Curves and Soil Index Properties with the MEPDG. NCHRP 9-23B Project Final Report.
14. Zapata, C.E. (2010). A National Catalog of Subgrade Soil-Water Characteristic Curve (SWCC) Default Inputs and Selected Soil Properties for Use with the ME-PDG. NCHRP 9-23A Final Report.
15. Mamlouk, M. and Zapata, C.E. (2009). *Pavement Design Research towards the Implementation of the Mechanistic-Empirical Pavement Design Guide.* Maricopa County Department of Transportation. Final Report. ASU-MCDOT Project.
16. **Cary, C. E.*** and Zapata, C. E. (2008). Evaluating the Utility of Existing PMS State FWD Deflection Data for Use in Implementing the ME-PDG for the Arizona DOT. SPR 606-Development and Implementation of the Mechanistic Empirical (M-E) Pavement Design Guide for Arizona, Inter Team Technical Report, August 2008.
17. Witczak, M.W., Zapata, C.E.* and Houston, W.N. (2006). Models Incorporated into the Current Enhanced Integrated Climatic Model: NCHRP 9-23 Project Findings and Additional Changes after Version 0.7. Final Report. Project NCHRP 1-40D.
18. Houston, S.L., Zapata, C.E., Houston, W.N. and **Dye, H.** (2006). *A Study of the Performance of Slab on Grade Residential Foundations on Expansive Soils in Arizona*. Final Report. Homebuilders Association of Central Arizona (HBACA).

19. Houston, W.N., Mirza, M.W. and Zapata, C.E.* (2006). *Calibration and Validation of the ICM Version 2.6*. Final Report. Project NCHRP 9-23: Environmental Effects in Pavement Mix and Structural Design Systems. National Cooperative Highway Research Program, Transportation Research Board.
20. Houston, W.N., Mirza, M.W., Zapata, C.E. and **Raghavendra, S.*** (2005). Calibration of PP1-98 (AASHTO Designation PP1-98: Standard Practice for Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel) and PP2 (AASHTO Designation PP2-99: Standard Practice for Mixture Conditioning of Hot Mix Asphalt) Protocols. Final Report. Project NCHRP 9-23: Environmental Effects in Pavement Mix and Structural Design Systems. National Cooperative Highway Research Program, Transportation Research Board.
21. Witczak, M.W., Zapata, C.E., and **Konareddy, P**.* (2003). *Input Data for the Calibration and Validation of the 2002 Design Guide for Rehabilitated Pavement Sections with HMA Overlays*. Development of the 2002 Guide for the Design of New and Rehabilitated Pavement Structures –Technical Report. National Cooperative Highway Research Program (NCHRP). Project 1-37A. Federal Highway Administration.
22. Witczak, M.W., Mirza, M.W.*, and Zapata, C.E. (2002). *Estimation of Distress Quantities for Smoothness Models for HMA-Surface Pavements*. Development of the 2002 Guide for the Design of New and Rehabilitated Pavement Structures –Technical Report. National Cooperative Highway Research Program (NCHRP). Project 1-37A.
23. Witczak, M.W., and Zapata, C.E.* (2002). *Input Data for the Calibration and Validation of the 2002 Design Guide for New Constructed Flexible Pavement Sections*. Development of the 2002 Guide for the Design of New and Rehabilitated Pavement Structures –Technical Report. National Cooperative Highway Research Program (NCHRP). Project 1-37A.
24. Witczak, M.W., Zapata, C.E.*, and Mirza, M.W. (2001). *Estimating Original Air Voids of GPS-LTPP Sections.* Development of the 2002 Guide for the Design of New and Rehabilitated Pavement Structures –Technical Report. National Cooperative Highway Research Program (NCHRP). Project 1-37A.
25. Houston, W.N., Mirza, M.W., Zapata, C.E.*, and others. (2001). *Environmental Effects in Pavement Mix and Structural Design Systems*. Technical Report. National Cooperative Highway Research Program (NCHRP). Project 9-23.
26. Witczak, M.W., Houston, W.N., and Zapata, C.E.* (2001). *Correlation of CBR Values with Soil Index Properties*. Development of the 2002 Guide for the Design of New and Rehabilitated Pavement Structures –Technical Report. National Cooperative Highway Research Program (NCHRP). Project 1-37A.
27. Witczak, M.W. and Zapata, C.E.* (2000). *Implementation of the EICM to Arizona Climatic Conditions*. Development of Performance Related Specifications for Asphalt Pavements in the State of Arizona, Project Report. ASU-ADOT Research Program.
28. Witczak, M.W., Houston, W.N., Zapata, C.E., Richter, C., Larson, G., and Walsh, K. (2000). *Improvement of the Integrated Climatic Model for Moisture Content Predictions*. Development of the 2002 Guide for the Design of New and Rehabilitated Pavement Structures – Inter Team Technical Report (Seasonal 4). NCHRP project 1-37A.
29. Houston, S.L.*, Houston, W.N., Zapata, C.E**.** and Johnson, M.J. (2000). *Hydraulic Loading Capacity for Groundwater Recharge Sites*. 15th Int. Conf., ISSMCE, Istanbul, Turkey: International Society for Soil Mechanics and Geotechnical Engineering.

Referred Archival Journal Publications from ASU

1. Kwon, P., Karmacharya, D., Zapata, C.E., Kavazanjian, E., and van Paassen, L. (2024). Microbial Induced Desaturation and Precipitation in Stratified Soils with Fine Sand and Silt Layers, *Acta Geotechnica*, https://doi.org/10.1007/s11440-024-02324-w.
2. Jiang, Y., Alajlan, Z., Zapata, C.E., Yu, X. (2024). Multiphysics Simulation of the Effects of Wicking Geotextile on Mitigating Frost Heave under Cold Region Pavement. *Geosciences* 2024, 14, 34. https://doi.org/10.3390/geosciences14020034.
3. Olaiz, A.H, Mosawi, M, and Zapata, C.E. (2021). An improved framework for volume change of shrink/swell soils subjected to time-varying climatic effects. *Soils and Rocks*, *An International Journal of Geotechnical and Geoenvironmental Engineering*, 44(3), [e2021065621]. https://doi.org/10.28927/SR.2021.06562, pp. 1-14. ***Invited paper and keynote***.
4. Stallings-Young, E.G., Mahabadi, N., Zapata, C.E. and van Paassen, L.A. (2021). Microbial-Induced Desaturation in Stratified Soil Conditions. *Int. Journal of Geosynthetics and Ground Engineering*, ASCE, 7 (37). https://doi.org/10.1007/s40891-021-00276-9
5. Gaspard, K.*, Zhang, Z., Gautreau, G., Hanifa, K., Zapata, C. and Abu-Farsakh, M. (2019). Modeling the Resilient Modulus Variation of In Situ Soils due to Seasonal Moisture Content Variations. Advances in Civil Engineering, Vol. 2019, Article ID 1793601, 7 pages. https://doi.org/10.1155/2019/1793601.
6. Zapata, C.E.*, Witczak, M.W. and **Palanivelu, P.** (2017). Evaluation of the Federal Aviation Administration Methodology for Characterizing the Nonlinear Behavior of Granular Base and Subbase Materials. Transportation Geotechnics Journal. doi.org/10.1016/j.trgeo.2017.06.004. Vol. 13, pp. 13-27.
7. **Rosenbalm, D.*** and Zapata, C.E. (2016). Effect of Wetting and Drying Cycles on the Behavior of Expansive Soils. Journal of Materials in Civil Engineering, ASCE. Vol. 29, No. 1, pp. 1-9.
8. **Cary, C.*** and Zapata, C.E. (2016). Pore Water Pressure Response of a Soil Subjected to Dynamic Loading under Saturated and Unsaturated Conditions. International Journal of Geomechanics, 10.1061/(ASCE)GM.1943-5622.0000642, D4016004, pp. 1-9.
9. Puppala, A.J., Pedarla, A.*, Hoyos, L. R., Zapata, C.E. and Bheemasetti, T.V. (2016). A Semi-Empirical Swell Prediction Model Formulated From 'Clay Mineralogy and Unsaturated Soil' Properties. Engineering Geology Journal. doi:10.1016/j.enggeo.2015.12.007, Vol. 200, pp. 114-121.
10. **Abbaszadeh, M.***, Houston, S.L. and Zapata, C.E. (2015). Influence of Soil Cracking on the Soil-Water Characteristic Curve of Clay Soil. Journal of Soils and Rocks. Vol. 38(1), pp. 49-58.

11. Salour, F.* ∞, Erlingsson, S. and Zapata, C.E. (2015). Model for Seasonal Variation of Resilient Modulus in Silty Sand Subgrade Soil: Evaluation with Falling Weight Deflectometer. Transportation Research Record. Vol. 2510, pp. 65-73.
12. Salour, F.* ∞**,** Erlingsson, S. and Zapata, C.E. (2014). Modelling Resilient Modulus Seasonal Variation of Silty Sand Subgrade Soils with Matric Suction Control. Canadian Geotechnical Journal. Vol. 51(12), pp. 1413-1422.
13. **Cary, C.E.*** and Zapata, C.E. (2014). Unsaturated Soil Modeling for Airfield Pavement Design. Journal of Transportation Engineering, ASCE. Vol. 140 (1), pp. 50-60.
14. **Cary, C.E.*** and Zapata, C.E. (2013) Integrating a National Database of Subgrade Soil-Water Characteristic Curves and Soil Index Properties with the M-EPDG. Transportation Research Record. Vol. 2349, pp. 41-51.
15. Zapata**, C.E.*, Cary, C.E., Souliman, M., Rosenbalm, D., and Salim, R**. (2012). Comparison of Airfield Flexible Pavement Design Thickness based upon Differing Agency Limiting Subgrade Strain Criteria. Transportation Research Record. Vol. 2305, pp. 141-149. Zapata's contribution: 30%.
16. **Cary, C.E.** and Zapata, C.E.* (2012). Modelo de Predicción del Módulo Resiliente para Suelos No Saturados. Revista Internacional de Desastres Naturales, Accidentes e Infraestructura Civil. Mayaguez, Puerto Rico. Vol. 12, No. 1, pp. 110-119.
17. Zapata, C.E.* and **Salim, R**. (2012). Impact of Environmental Site Location and Groundwater Table Depth on the Thickness of Flexible Airfield Pavements. *Transportation Research Record: J. of the Transportation Research Board*, Vol. 2282, pp. 22-33.
18. **Souliman, M.I**.*, Mamlouk, M., Zapata, C.E. and **Cary, C.E.** (2011). Data Collection to Support Implementation of the Mechanistic-Empirical Pavement Design Guide for County Roads. *Transportation Research Record: Journal of the Transportation Research Board*, Vol. 2225, pp. 67-77. Zapata's contribution: 25%.
19. **Souliman, M.*** and Zapata, C.E. (2011). International Case Studies of Peat Stabilization by Deep Mixing Method. *Jordan Journal of Civil Engineering*, Vol. 5 No. 3, pp. 424-430. Student participation: 60%
20. **Cary, C.*** and Zapata, C.E. (2011). Resilient Modulus for Unsaturated Unbound Materials. International Journal of Roads Materials and Pavement Design. Vol. 12, Issue 3, pp. 617-640.
21. Houston, S.L. **Dye, H.B.*,** Zapata, C.E., Walsh, K.D. and Houston, W.N. (2011). Study of Expansive Soils and Residential Foundations on Expansive Soils in Arizona. ASCE *Journal of Performance of Constructed Facilities,* Vol. 25, Issue 1, pp. 31-44.
22. **Souliman, M**., Mamlouk, M., El-Basyouny, M. and Zapata, C.E. (2010). Calibration of the AASHTO MEPDG for Flexible Pavement for Arizona Conditions. *International Journal of Pavements*. Vol. 9. No. 1-2-3, pp. 2-13.
23. Mamlouk, M.* and Zapata, C.E.* (2010). Necessary Assessment of Use of State Pavement Management System Data in Mechanistic-Empirical Pavement Design Guide Calibration Process. *Transportation Research Record: Journal of the Transportation Research Board*, Vol. 2153, pp. 58-66. Zapata's contribution: 50%
24. **Cary, C.** and Zapata, C.E. (2010). Enhanced Model for Resilient Response of Soils Resulting from Seasonal Changes as Implemented in "Mechanistic-Empirical Pavement Design Guide". *Transportation Research Record: Journal of the Transportation Research Board of the National Academies*, No 2170, *Geology and Properties of Earth Materials 2010*, pp. 36-44.
25. Zapata, C.E.*, **Perera, Y.Y**. and Houston, W.N. (2009). Matric Suction Prediction Model Used in the New AASHTO Mechanistic-Empirical Pavement Design Guide. *Transportation Research Record: Journal of the Transportation Research Board, No. 2101, Geology and Properties of Earth Materials,* pp. 53-62.
26. Carlson, J.*, Kaloush, K., Golden, J., **Arab, M.**, and Zapata, C. (2008). Evaluation of In Situ Temperatures, Water Infiltration and Regional Feasibility of Pervious Concrete Pavements. *International Journal of Pavements*, Vol. 7, No. 1-2-3, pp. 96-108.
27. Zapata, C.E.*, **Andrei, D**., Witczak, M.W., & Houston, W.N. (2007). Incorporation of Environmental Effects in Pavement Design. *Int. J. of Road Materials and Pavement Design*, Vol. 8, Issue 4. pp 667-693. ***Invited and keynote presentation.***
28. **Raghavendra, S.*,** Zapata, C.E., Mirza, M.W., Houston, W.N., and Witczak, M.W. (2005). Verification and Improvement of the Rate of Asphalt Aging Simulated by AASHTO PP1-98 Protocol. *Transportation Research Record: Journal of the Transportation Research Board* No.1901, Bituminous Binders, pp. 24-32. Student participation: 40%; Zapata's contribution: 30%
29. Houston, S.L., Houston, W.N., Zapata, C.E., and Lawrence, C. (2001). Geotechnical Engineering Practice for Collapsible Soils. *Geotechnical and Geological Engineering Journal*. Vol. 19(3-4). pp. 333-355. Also, in *Unsaturated Soil Concepts and Their Application in Geotechnical Practice*, David G. Toll (ed). Kluwer Academic Publishers, Durham, U. K.; Zapata's contribution: 25%

Monographs/Books – Other Scholarly Work

1. Zapata, C.E., Mosawi, M., Olaiz, A.H., Yu, X, Dong, S., Jiang, Y. (2024). Subgrade Soil Susceptibility to Shrink/Swell and Frost Heave: Effects on Pavement Performance, DOI: 10.17226/27778, ISBN: 978-0-309-70963-7, April 2024.
2. Zapata, C.E. and Alothman, S. (2023). *Moisture Measurement for Pavement Foundations and Slopes*, NCHRP Synthesis 612. National Cooperative Highway Research Program, Transportation Research Board, of the National Academies of Sciences, Engineering, and Medicine. ISBN 978-0-309-70914-9 | DOI 10.17226/27299, 79 pages.
3. Zapata, C.E.* (2010). Research Results Digest 347: A National Catalog of Subgrade Soil-Water Characteristic Curves and Selected Soil Properties for Use with the MEPDG. National Cooperative Highway Research Program, Transportation Research Board, of the National Academies. ISSN 0077-5614. ISBN: 978-0-309-09929-5. Library of Congress Control Number 2008924251. pp. 23.
4. Zapata, C.E.* and Houston, W.N. (2008). *Calibration and Validation of the Enhanced Integrated Climatic Model for Pavement Design*. *NCHRP Report 602*. National Cooperative Highway Research Program, Transportation Research Board, of the National Academies. ISBN: 978-0-309-15494-9. pp. 62. http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_602.pdf

5. Houston, W.N., Mirza, M.W.[X], Zapata, C.E. and Raghavendra, S. (2007). Research Results Digest 324: Simulating the Effects of Hot Mix Asphalt Aging for Performance Testing and Pavement Structure Design, National Cooperative Highway Research Program, Transportation Research Board of the National Academies. October 2007. pp. 7. Student participation: 25%; Zapata's contribution: 30%

PRESENTATIONS

Keynote Speaker – International Venues

1. Keynote: State of the Art: Transportation Geotechnics. 20th International Conference of Soil Mechanics and Geotechnical Engineering, ISSMGE, Sydney, Australia, May 2022.
2. Keynote: Aspectos Geotécnicos en el Diseño de Pavimentos: De la Corrección a la Prevención. XI Mexican Congress of Asphalt, Cancún, MX, Oct 27, 2021
3. Keynote: An Improved Framework for Volume Change of Shrink/Swelling Soils Subjected to Time-Varying Climatic Effects, Third Pan-American Conference on Unsaturated Soils, ISSMGE, Rio de Janeiro, Brazil, 25-28 July, 2021.
4. Keynote: Mechanistic-Empirical Pavement Design Considerations of Swelling/Shrinkage of Expansive Soils, 4th International Conference on Transportation Geotechnics (ICTG), Chicago, May 24-27, 2021.
5. Keynote Closing Speaker, Geotechnical Aspects of Pavement Design, International Society of Asphalt Pavements, Costa Rica, March 19, 2021
6. State of the Art: Implementing Environmental Effects on a Mechanistic-Empirical Approach to Pavement Design, University of Piura, Lima, Peru. August 6, 2013.
7. Workshop: “Unbound Soils /Subbase and Base Materials”. U. Costa Rica (UCR) LANAMME, San Jose, Costa Rica. Dec 5-6, 2012.
8. "Geotechnical Engineering and Problematic Soils". Universidad Metropolitana, San Juán, Puerto Rico. Nov. 2007.
9. “Incorporation of Environmental Effects in Pavement Design”. XVI Colombian Symposium in Pavement Engineering, Manizales, Colombia. Sept. 2007.
10. "Incorporation of Environmental Effects in Pavement Design". International Workshop on Water in Pavements – WIP'05, Oct. 27th, Madrid, Spain. Oct. 2005.
11. "Sustainable Development: A New Approximation to the Design Materials and Construction of Roads". 12th International Symposium of Civil Engineering. Monterrey Tec University, Monterrey, Mexico. Feb. 2005.

Invited Speaker – International Venues

1. “Consideraciones Climáticas y Uso de Teoría de Suelos No Saturados en el Diseño de Pavimentos: Enfoque Empírico”, Javeriana University, Bogotá, Colombia, Nov. 2020
2. “Unsaturated Soil Mechanics for Compacted Materials”, Rail Track Technology & Geotechnical Engineering Research Showcase 2019, Wollongong, Australia, Dec 18, 2019.
3. “Use of Unsaturated Soil Mechanics in Pavement Design: Empirical Approach”, Workshop on Asphaltic Materials Technology: 2019 Women in Engineering. Monterrey, Mexico, March 19, 2019.
4. “Empirical Approach for the Use of Unsaturated Soil Mechanics in Pavement Design”. Second Pan-American Conference on Unsaturated Soils, Dallas, Texas, Nov. 13, 2017.
5. “Volume Change Behavior of Expansive Soils due to Wetting and Drying Cycles”. International Series. Beijing Jiaotong University, Beijing, China, Sept. 26, 2017
6. “Considerations of Climate in the Latest AASHTO Mechanistic-Empirical Pavement Design Guide. International Series. Beijing Jiaotong University, Beijing, China, Sept. 25, 2017
7. Seminar on the Operation of New Aircraft at Existing Airports - Physical Characteristics and Pavements, Unbound Material Characterization. International Civil Aviation Organization (ICAO), Lima, Peru. August 6-9, 2013.
8. "Development of a Mechanistic-Empirical Pavement Design Guide for Latin-American Countries". XVI CILA -Ibero-Latin-American Congress on Asphalt, Rio de Janeiro, Brazil. Nov. 2011.
9. "Resilient Modulus Testing for Unsaturated Unbound Materials". Second International Summit of Hispanic Geotechnical Engineering Professors. Georgia Tech, Atlanta, Oct. 2011.
10. "Sensitivity Analysis of Environmental Factors on Flexible Pavement Performance". Workshop on Climate Effects on Pavement Infrastructure for the 8th Int. Conf. on the Bearing Capacity of Roads, Railways, and Airfields, Urbana-Champaign, IL. July 2009.
11. "Expansion Index and Its Relationship with Other Index Properties". Fourth International Conference on Unsaturated Soils, April 2-6, 2006, Carefree, AZ.
12. "State of the Art on the Behavior of Partially Saturated Soils. From the Theory to the Practice". First Week of Civil Engineering, University of Guadalajara, Guadalajara, Mexico. April 2003.

Invited Speaker – National Venues

1. Mechanistic-Stochastic Framework for the Implementation of Swell/Shrink Soils in Pavement Design Procedures. Guest lecture, Jackson State University, Jackson, MS, April 19, 2024.
2. Moisture Measurement for Pavements, Foundations and Slopes. NCHRP Synthesis Topic 53-18 Overview. AKG40 Committee on Mechanics and Drainage of Saturated and Unsaturated Geomaterials Meeting, TRB, Jan 10, 2023, Washington, DC.

3. “Moisture Measurements for Foundations and Slopes in Pavement Infrastructure. NCHRP Synthesis Topic 53-18 Overview” AKG60 Committee on Geotechnical Instrumentation and Modeling Meeting, TRB, Jan 11, 2022, Washington, DC.
4. “NCHRP 01-59: Proposed Enhancements to Pavement ME Design: Improved Consideration of the Influence of Subgrade Soils Susceptible to Shrink/Swell and/or Frost Heave on Pavement Performance”. AKG40 Committee on Mechanics and Drainage of Saturated and Unsaturated Geomaterials Meeting, TRB, Jan. 2021
5. “Integrating Education and Research at All Levels”. Geotechnical Engineering Faculty Teaching Strategies and Resources Workshop, Minneapolis, MN, Feb 25, 2020.
6. “Considerations of Climate in the Latest AASHTO Mechanistic-Empirical Pavement Design Guide”. Geo-Institute Oklahoma Chapter meeting, Oklahoma City, OK, April 20, 2017.
7. “Volume change Behavior of Expansive Soils due to Wetting and Drying Cycles”. Oklahoma U., Norman, OK, April 20, 2017.
8. 'Incorporation of Unsaturated Soil Principles into Common Geotechnical Problems", AMEC Technical Summit, Atlanta, GA, October 15-16, 2011.
9. "Applications of Unsaturated Soils to Pavement Design", ASCE Continuing Education and the Geo Institute. Webinar, August 2010; June 2011.
10. "A National Catalog of Subgrade Soil-Water Characteristic Curve (SWCC) Default Inputs and Selected Soil Properties for Use with the ME-PDG". NCHRP Workshop in conjunction with FHWA Expert Task Group Meetings, National Academy of Science, Irvine, CA, February 2010; Also, Webinar in March 2010.
11. "Unbound Material Moisture Prediction Models Incorporated into the ME-PDG". 2009 TRB Annual Meeting Workshop. Environmental Effects in the MEPDG. Washington D.C., January 2009.
12. "Characterization of Expansive Soils using Simple Index Properties". Symp. on Problem Soils and Surficial Deposits. Santa Fe, NM, May 2008.
13. "Unsaturated Soil Concepts applied to Environmental Effects in Pavement Design". 87th Transportation Research Board Meeting, AFP60 Committee Meeting. January 2008.
14. "Climate in the Mechanistic-Empirical Pavement Design Guide –MEPDG". AASHTO Joint Committee on Pavements Seminar. Irvine, CA. April 10-11, 2007.

Conference Presentations

1. Larson, J., Zapata, C.E. and Kavazanjian, E. (2022). Connecting Research to the Broader Community: Developing and Implementing a Graduate Course Across an Engineering Research Center’s Partner Universities. American Society for Engineering Education (ASEE) 2022 annual conference and exposition, Minneapolis, MN, June 26-29, pp. 1-7, https://peer.asee.org/41901.
2. Stallings Young, E.G., Zapata, C.E. and van Paassen, L.A. (2022). Experimental Investigation of Microbial Induced Desaturation and Precipitation (MIDP) in a Layered Granular Soil System. In Proc. of the 2022 Geo-Congress, ASCE. GSP 331, https://doi.org/10.1061/9780784484012.036, March 20-23, 2022, pp. 347-355.
3. **Stallings Young, E.G.***, Zapata, C.E. and van Paassen, L. (2020). Unsaturated Fluid Flow through Granular Soils Treated with Microbial Induced Desaturation and Precipitation. In *Proceedings of the 4th European Conference on Unsaturated Soils (E-UNSAT 2020) Online Conference*, 195, 05003 (2020), October 19-21st, 2020, DOI: https://doi.org/10.1051/e3sconf/202019505003
4. Larson, J., Barnard, W., Chandler, J., O’Donnell, M., Savenye, W. and Zapata, C.E. (2020, Feb). Moving Beyond Technical Skills: Fostering the Development of Essential Skills Needed for a Successful Career in Engineering. In Proceedings of the ASCE Geo-Congress 2020: Geotechnical Earthquake Engineering and Special Topics, GSP 318, ISBN (PDF): 9780784482810, Hambleton, J.P., Makhnenko, R. and Budge, A.S (eds.), Feb. 25-28, 2020, Minneapolis, Minnesota.
5. Savenye, W., Chandler, J. L. S., Larson, J., Zapata, C.E., Bronner, C., Hong, Y-C., Archambault, L., Elwood, K., Nielsen, M., Strand, E., Spector, M., & Dalal, M. (2019, Oct). Building Up the Next Generation through Mentoring: Lessons Learned and Best Practices from Three Perspectives. Association for Educational Communications and Technology (AECT). Oct 19-25, Las Vegas, Nevada.
6. Savenye, W. ~, Larson, J., Zapata, C., Kavazanjian, E., Elwood, K., Barnard, W., O'Donnell, M., Chandler, J., Saenz, D., Woolley, M., van Paassen, L., Bronner, C., DeJong, J., Martinez, A., Greer, J., Mitchell, M., Brown, S., Frost, D., Newstetter, W., Vangla, P., & Siegel, A. (2018, June). Building and evaluating education and outreach programs for an NSF engineering research center, the Center for Bio-mediated and Bio-inspired Geotechnics (CBBG). Paper session presented at the meeting of the EdMedia + Innovate Learning, Amsterdam, Netherlands.
7. Gaspard, K.~, Zhang, Z., Gautreau, G. Hanifa, K. Zapata, C. and Abufarsakh, M. (2018). Modeling the In-situ Seasonal Variation Potential of Resilient Modulus in Subgrade Soils. TRB meeting, Jan. 6-11, 2018.
8. **Elwood, K.~**, Savenye, W., Larson, J., Jordan, M. E., & Zapata, C. (2017, November). Wicked instructional problems: Exploring how STEM teachers use design thinking. Paper session presented at the meeting of the Association for Educational Communications & Technology, Jacksonville, FL.
9. Zapata, C. E. ~(2017). Empirical Approach for the Use of Unsaturated Soil Mechanics in Pavement Design. Presented on the Second Pan-American Conference on Unsaturated Soils, Nov. 12-15, Dallas, Texas.
10. **Thirthar Palanivelu, P.** and Zapata, C.E.~ (2017). Assessment of Cary and Zapata Suction Based Model for Prediction of Resilient Modulus in Fine Grained Subgrade Soils. Presented on the Second Pan-American Conference on Unsaturated Soils, Nov. 12-15, Dallas, Texas.

11. **Thirthar Palanivelu, P.** and Zapata, C.E. (2017). Evaluation of a Resilient Modulus Model for Unsaturated Soil Conditions. In Proc. of the 10th Int. Conf. on the Bearing Capacity of Roads, Railways and Airfields, BCRRA 2017. June 28-30, Athens, Greece. pp. 3-10.
12. Larson, J.*~, Savenye, W., Zapata, C.E. and Kavazanjian, E. (2017). Implementation of an Introductory Module on Biogeotechnics in a Freshman Engineering Course. In Proceedings of the 2017 American Society of Engineering Education Annual Conference and Exposition, Columbus, OH, June 25-28, 2017, pp. 1-19.
13. **Dalal, M.~,** Larson, J., Zapata, C., Savenye, W., Hamdan, N. & Kavazanjian, E. (2017, March). An Interdisciplinary Approach to Developing an Undergraduate Module on Biogeotechnical Engineering. Society for Information Technology & Teacher Education International Conference, Austin, TX, USA.
14. **Elwood, K.**, Savenye, W., Jordan, M.E., Larson, J., and Zapata, C.E. (2016). Design Thinking: A New Construct for Educators. Proceedings of the Association for Educational Communications and Technology, Las Vegas, NV, Vol. 1, 43-52.
15. Savenye, W., Larson, J., Zapata, C., Kavazanjian, E., Elwood, K., Reed, A., Mitchell, M., Brown, S., Bronner, C., Saenz, D., Newstetter, W., Benton-Johnson, F., Dalal, M., Gomez, M., & Delgado, N. (2016). The Ultimate Higher Education Start-Up: Building Education, Outreach and Diversity for an NSF Engineering Research Center. Paper *presented* at the annual meeting of the Association for Educational Communications and Technology, Las Vegas, NV, October 17-21, 2016.
16. **Lu, Y.** and Zapata, C.E. (2016). Temperature Effects on the Unsaturated Hydraulic Properties of Two Fine-Grained Soils and their Influence on Moisture Movement under an Airfield Test Facility. Proceedings of the 2016 Geotechnical and Structural Engineering Congress, Feb. 14-17, Phoenix, AZ, pp. 569-583.
17. **Gowda, R.P.C.** and Zapata, C.E. (2016). Effect of Bagasse Fiber on the Properties of Compressed Cement Stabilized Earth Blocks. Proceedings of the 2016 Geotechnical and Structural Engineering Congress, Feb. 14-17, Phoenix, AZ, pp. 1435-1449.
18. **Palanivelu, P.T.,** Zapata, C.E. and Underwood, S. (2016). Effect of As-Compacted Moisture Content and Density on Pavement Performance in Different Climatic Regimes. Geotechnical and Structural Engineering Congress, Feb. 14-17, Phoenix, AZ.
19. Abbaszadeh, S., Houston, S.L. and Zapata, C.E. (2016). Effect of Desiccation Cracking on the Swell and Swell Pressure of Expansive Clay. Geotechnical and Structural Engineering Congress, Feb. 14-17, Phoenix, AZ.
20. Rosenbalm, D. and Zapata, C.E. (2015). Stochastic Solution to the Subgrade Resilient Modulus: Monte Carlo Approach. Proceedings of the XV Pan-American Conf. on Soil Mechanics and Geotechnical Engineering, Nov 15-18. Buenos Aires, Argentina, pp. 314-321.
21. **Ornelas, A**., Houston, S., Savenye, W., Zapata, **C.E., Ramirez**, E. and **Corral, A**. (2015). Disciplinary Diversity in the Development of Geotechnical Engineering Undergraduate Education Materials. 2015 International Foundations Congress and Equipment Expo (IFCEE), pp. 2161-2168. doi: 10.1061/9780784479087.200
22. **Pedarla, A.**, Puppala, A., Hoyos, L., Zapata, C.E. and Chittoori, B. (2014). Study of SWRC Modeling Parameters with Variation in Swelling Behavior and Mineralogy of Four Compacted Expansive Clays. Unsaturated Soils: Research and Applications - Proceedings of the 6th International Conference on Unsaturated Soils, UNSAT 2014, v 2, pp. 951-957.
23. Rosenbalm, D. and Zapata, C.E. Stochastic Approach to Estimate the Resilient Modulus for Unbound and Subgrade Materials. 94th annual meeting of the Transportation Research Board, Washington D.C, Jan. 2015.
24. Rosenbalm, D. and Zapata, C.E. Volume Change Behavior of Compacted Expansive Soils Subjected to Multiple Wetting and Drying Cycles. Association of Engineering Geologists Annual meeting. Scottsdale, AZ. 2014.
25. Savenye, W., Houston, S., Zapata, C., **Ornelas, A., Corral, A., Sadauskas, J., & Ramirez, E.** Needs assessment for designing an interdisciplinary, flexible, engineering instruction module. In M. Simonson (Ed.), Annual meeting of the Association for Educational Communications and Technology (AECT), Anaheim, CA, Oct. 29 - Nov. 2, 2013.
26. Ornelas, A., Savenye, W. Sadauskas, J., Houston, S., Zapata, C. and Ramirez, E. An Engineering and Educational Technology Team Approach to Introducing New Unsaturated Soils Mechanics Material into Introductory Undergraduate Geotechnical Engineering Courses: Cross-Curricular Coordination & Working Outside of Your Comfort Zone. Conference in California, June 2013.
27. Rosenbalm and Zapata. First Pan-American Conference on Unsaturated Soils. Cartagena, Colombia, February 2013.
28. Cary and Zapata. Integrating a National Database of Subgrade Soil-water Characteristic Curves and Soil Index Properties with the MEPDG. Transportation Research Board meeting. Washington D.C. Jan. 2013.
29. "Environmental Effects on Airfield Design". 2012 Pavement/Materials Conference, Tempe, AZ, October 31st 2012.
30. "Comparison of Airfield Flexible Pavement Design Thickness Based upon Differing Agency Limiting Subgrade Strain Criteria" Transportation Research Board meeting. Washington D.C. Jan. 2012
31. "Impact of Environmental Site Location and Groundwater Table Depth on the Thickness of Flexible Airfield Pavements". Transportation Research Board meeting. Washington D.C. Jan. 2012
32. "Laboratory Determination of Soil-Water Characteristic Curves for Cracked Soil". International Conference of Unsaturated Soils UNSAT 2010 – Barcelona, Spain, September 2010.
33. "A New Generation of Resilient Modulus Characterization of Unbound Materials". International Foundation Congress & Equipment Expo 2009 – IFCEE, Orlando, FL, March 2009.
34. "Matric Suction Prediction Model Used in the New AASHTO Mechanistic Empirical Pavement Design Guide". 2009 Transportation Research Board annual meeting. National Academies. Washington D. C., January 2009.
35. "Considerations of Climate in the New AASHTO Mechanistic Empirical-Pavement Design Guide". 2009 Transportation Research Board annual meeting. National Academies. Washington D.C., January 2009.

36. "Evaluating the Utility of Existing Pavement Management System State Deflection Data For Use in the Implementation of the Mechanistic Empirical-Pavement Design Guide for Arizona". Poster. 2009 Transportation Research Board annual meeting. National Academies. Washington D. C., January 2009.
37. "Prediction of Soil-Water Characteristic Curves (SWCC) of Granular and Fine Grained Soils". First Sri Lankan Geotechnical Society International Conference on Soil and Rock Engineering. Colombo, Sri Lanka, August 2007.
38. "Unbound Material Properties". ASU-ADOT Arizona Pavements/Materials Conference. Tempe, AZ. Oct. 2007.
39. "Development of Asphalt Concrete Rutting Model Using Permanent Strain Database", Transportation Research Board annual meeting. National Academies. Washington D. C., January 2007.
40. "Expansion Index and Its Relationship with Other Index Properties". Fourth International Conference on Unsaturated Soils, Carefree, AZ. April 2006.
41. "Environmental Effects in Pavement Mix Design – Arizona Perspective". ASU-ADOT Arizona Pavements/Materials Conference. Tempe, AZ. April 2006.

Invited Speaker – Local Venues

1. Workshop: "Soils Engineering for Pavements", Maricopa Department of Transportation, Phoenix, AZ, Aug. 2016.
2. "Incorporating Environmental Effects in Pavement Design", Geo-Institute Arizona Chapter meeting, Tempe, AZ, Oct. 2014.
3. ASCE Geo-Institute Student chapter, talk to Geotechnical students at Arizona State University, Tempe, AZ, March 2013.
4. Barrett's Honor College, talk to freshmen residents about Geotechnical Engineering, Tempe, AZ, March 2013.
5. Arizona Chapter of the ASCE, Tempe, AZ, August 2012.
6. "Implementation of Unsaturated Soil Mechanics into Engineering Practice". AMEC. Tempe, AZ. March 2011.

Invited Speaker – ASU Internal

1. "Unsaturated Soils in Pavement Design", Hydrosystems Engineering Seminar Series, SSEBE, Tempe, AZ, Feb. 2021.
2. Xhi Epsilon, Arizona State University Chapter, Tempe, AZ, April 2012.
3. More Graduate Education @ Mountain States Alliance (MGE@MSA) Graduate Student Workshop. Graduate College, Arizona State University. Tempe, AZ, February 2012.
4. "A Journey to Be Able to Be Here with You Today". More Graduate Education @ Mountain States Alliance (MGE@MSA) Graduate Student Workshop. Graduate College, Arizona State University. Tempe, AZ, December 2008.

Continued Education – Other workshops, seminars and conferences attended

- 2015 Educate the Educator workshop on Geosynthetics. Austin, TX. July 2015.
- 2014 Geo-Congress. Atlanta, Georgia. February 2014. Session organizer and moderator.
- 2013 Professor's Driven Pile Institute, Pile Driving Contractor's Association (PDCA) Workshop on Deep Foundations. Logan, Utah. June 23-28, 2013. Invited.
- First Congress on Transportation Infrastructure. Citrans, LannameUCR, San Jose, Costa Rica. June 15-17, 2011. Invited.
- Summit on Alternative Energy, Governor's Office, State of Arizona, Feb. 11, 2010, Tempe, AZ. Invited.
- 2008 Civil Engineering Faculty Workshop on Deep Foundations. The International Association of Foundation Drilling (ADSC). Chattanooga, TN. June 8-14, 2008. Invited.
- Third European Asphalt Technology Association (EATA) Conference. Lyon, France. 14-15 April 2008.
- GeoCongress 2008: The Challenge of Sustainability in the Geoenvironment. Annual Congress of the Geo-Institute of ASCE March 9-12, 2008.
- Transportation Research Board Annual Meeting. Every year since 2006.
- ASU-ADOT Arizona Pavements/Materials Conference. Tempe, AZ. Every year since 2001.
- Superpave Support and Performance Models Management. NCHRP & ASU. Tempe, AZ. Aug. 1999.
- Ninth Biennial Symposium on Artificial Recharge of Groundwater. Arizona Hydrological Society, Arizona Department of Water Resources, Dames & Moore, and U.S. Water Conservation Laboratory. Tempe, AZ. June 1999.
- Fourth Annual National Hispanic Sustainable Energy and Environmental Conference. U.S. Department of Interior and National Hispanic Environmental Council. San Jose, CA. April 1999.
- Fifth Geotechnical Congress: Geotechnical Engineering and the Environment. Geotechnical Colombian Society and EAFIT University. Medellín, Colombia. June 1994.
- Design and Maintenance of Flexible Pavements. Universidad del Cauca. Popayán, Colombia. Aug. 1987.

PROFESSIONAL ACTIVITIES AND SERVICE

International Level

Evaluation Committee member for the Latin-American Award to Outstanding Women in the Field of Asphalt Pavements and Materials for the Mexican Association of Asphalt, A.C. - Appointed **2021-Present**

Member of the Editorial Board for Elsevier Transportation Geotechnics International Journal **2021-Present**

Advisory Technical Committee member for the ISSMGE TC106 Committee 3rd Pan-American Conference on Unsaturated Soils, Rio de Janeiro, Brazil, July, 25-28, 2021 **2019-2021**

Preparation of State of the Art Report for the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE) presented on the 20th Int. Conf. on Soil Mechanics and Geotechnical Eng. in Sydney, Australia in 2021. Invited. **2019-2022**

Guest Lead Editor for Geosciences – Open Access Journal (ISSN 2076-3263) **2019**

Member of the Editorial Board of the IJRA - International Journal of Roads and Airports (ISSN 2036-2595) **2009-2018**

National Level

Associate Editor for the Journal of Geotechnical and Geological Engineering - Appointed **2023-Present**

Peer reviewer of one application for full professor position at Texas A&M **2019**

Chair of the following technical committees:

- Transportation Research Board - Engineering Behavior of Unsaturated Soils Committee, AFP60, Appointed. **2012 – 2018**

Panelist for the National Science Foundation

- Panelist for the 2022 Civil & Environmental Engineering CARRER Panel **2022**
- Panelist for the 2020 CMMI Panel **2020**
- Panelist for the 2017 Civil & Environmental Engineering CAREER Panel **2017**
- Panelist for the 2012, 2013 NSF Graduate Research Fellowship Evaluation Program **2012, 2013**
- Panelist for 2012 Civil & Environmental Engineering Panel **2012**

Technical committee member for the following organizations:

- Standing Committee on Soil and Rock Properties and Site Characterization, AKG20, Appointed. **2020-2025**
- Standing Committee on Mechanics and Drainage of Saturated and Unsaturated Geomaterials, AKG40 **2020-2025**
- ASCE Geo-Institute Unsaturated Soils Committee. **2008-Present**
- Transportation Research Board - Engineering Behavior of Unsaturated Geomaterials Committee, AFP60. **2007-2020**
- Transportation Research Board - Committee on Soil and Rock Properties, AFP30, Appointed. **2018 –2020**
- Transportation Research Board - Committee on Seasonal Climatic Effects Including Frost Action on Transportation Infrastructure, AFP50, Appointed. **2010 – 2019**
- Transportation Research Board – Latin American Transportation Research and Practice Subcommittee, A0010(1). **2006-2013**

Organizer of the following national/international meetings/conference/conference sessions:

- Co-chair for Workshop panel on Graduate School for Hispanic minorities for the Society of Hispanic Professional Engineers (SHPE) National Conference, October 30, 2019, Phoenix, AZ **2019**
- Geo-Congress 2020, Minnesota. Co-chair of session on Geotechnical Engineering Education **2019**
- Geo-Congress 2020, Minnesota. Co-chair and panelist for session on Railroad Geotechnics **2019**
- ASU-ADOT Pavements/Materials/ Transportation Conference organizing committee, Tempe, AZ. 20 conferences. (since 2002). Average attendance: 400 participants. **2002-Present**
- Transportation Research Board 2018 annual meeting. Organizer of 3 sessions and moderator of 2 sessions. **2017**
- Pan-American Conference of Unsaturated Soil Mechanics, Dallas, Nov. 2017. Organizer and moderator of 1 session. **2017**
- Transportation Research Board 2017 annual meeting. Organizer of 2 sessions and moderator of 1 session. **2016**
- International Conference of Transportation Geotechnics, September 2016, Portugal. Co-chair of Unsaturated Soils for Transportation Geotechnics track. One session. **2016**
- Geo-Congress, Feb. 2016, Phoenix, AZ. Organizer and moderator of Unsat. Soil Mechanics session. 75 attendants. **2016**
- Transportation Research Board 2016 annual meeting. Organizer and moderator of 3 sessions. **2015**
- Pan-American Congress of Soil Mechanics, November 2015, Buenos Aires, Argentina. Chair of Transportation Geotechnics track. **2015**
- International Symposium on Systematic Approaches to Environmental Sustainability in Transportation, August 2-5, 2015, Fairbanks, Alaska, USA. Member of the Technical Committee. **2015**
- Transportation Research Board 2015 annual meeting. Organizer and moderator of 2 sessions. **2014**
- Unsaturated Soils Symposium. Association of Engineering Geologist Annual Meeting. Scottsdale, AZ. 25 attendants. **2014**
- Workshop: Benefits of Geotechnical Instrumentation: Case Histories from Transportation Applications, Washington D.C. 75 attendants (full). **2014**
- Geo-Congress sessions on Unsaturated Soils. Organizer and Moderator. Atlanta, GA. 100 attendants **2014**
- Workshop on Deploying Soil and Rock Instrumentation to Solve Real Problems, Washington D.C. 75 attendants (full). **2013**
- Workshop on Climate Effects on Pavement Infrastructure for the 8th International Conference on the Bearing Capacity of Roads, Railways, and Airfields, Urbana-Champaign, IL. 50 attendants (full). **2009**
- Workshop on Environmental Effects in the ME-PDG, Washington D.C. 50 attendants (full). **2009**
- Unsaturated Soils International Conference, Carefree, AZ (2004-2006). 375 attendants. **2006**

Official reviewer for the following journals and editorials: **1997-Present**

- Transportation Geotechnics Journal, ASCE International Journal of Geomechanics, The American Society of Civil Engineers - Journal of Geotechnical and Geoenvironmental Engineering, American Society of Testing Materials - Geotechnical Testing Journal, Soil Science Society of America Journal, Geo-Institute Congress, ASCE Geo-Institute, ASCE Geotechnical Engineering

Division, PWS Publishing Company, Boston, Massachusetts, International Journal of Road Materials and Pavement Design, Transportation Research Board.

Local Level

Leadership: Associate Director for the USDOT National Center for Infrastructure Transformation **2023-Present**

Leadership: Deputy Director for NSF Center for Bio-mediated and Bio-inspired Geotechnics, overviewing the Education, Diversity and Outreach Programs. **2015-Present**

- More than 360 outreach events for k-12 populations have been accomplished at the four partner universities (Arizona State, New Mexico State, UC Davis and Georgia Tech), reaching more than 10500 students and 3170 teachers. Workshops, webinars and short courses have reached more than 9000 attendants.
- Accomplishments during 2021 included 25 outreach events with 705 participants; and three summer programs for Young Scholars, Research Experience for Undergraduate Students and Teachers. The Hispanic/Latinx undergraduate student population reached 44 % in 2021, with 20% at ASU.
- Accomplishments during 2020 included broadening the participation of k-12 and under-represented populations in the field, by overviewing online outreach events and three summer programs. The Hispanic/Latinx graduate student population reached 34% and the undergraduate student population reached 34% also in 2020, with 21% at ASU.
- Accomplishments during 2019 included broadening the participation of k-12 and under-represented populations in the field, by overviewing more than 30 public events and three summer programs.
- Accomplishments of team during 2018 included 41 outreach events with more than 1,400 participants; and three summer programs for research experience at the 4 participant institutions: Young Scholar program (5 high school students), REU program (16 undergraduate students, 8 at ASU) and RET program (7 high school/college STEM teachers, 6 at ASU).
- Accomplishments of team during 2017 included 25 outreach events with 2,487 participants; and three summer programs for research experience: Young Scholar program (4 high school students), REU program (8 undergraduate students) and RET program (9 high school/college STEM teachers).
- Accomplishments of team during 2016 included 32 public outreach events with 6,400 participants; and three summer programs for research experience: Young Scholar program (8 high school students), REU program (13 undergraduate students) and RET program (11 high school/college STEM teachers).

Chair of the following committees:

– SSEBE Scholarship Committee. Appointed. **2016 – 2021**

Technical committee member for the following organizations:

– CESE Academic Affairs Committee (Curriculum) - appointed **2024-2027**
– SSEBE pavement materials faculty search committee **2024**
– SSEBE Advisory Committee member **2021-2025**
– SSEBE geotechnical faculty search committee **2022-2023**
– SSEBE manufacturing/structural faculty search committee **2022**
– SSEBE geotechnical faculty search committee **2021**
– Pavement Materials Conference committee Arizona State University-Arizona Department of Transportation **2002-Present**
– CBBG Biogeotechnical faculty search committee **2017-2018**
– SSEBE Laboratory committee **2015, 2016**
– SSEBE water resources faculty search committee **2013 to 2015**
– SSEBE geotechnical faculty search committee **2013, 2015**
– SSEBE Scholarship committee member since 2011 (Last appointment: 2016-2017). **2016-2017**
– Ira A. Fulton School of Engineering, Arizona State University – FSE Research Advisory Committee. Elected. **2008-2012**
– Department of Civil, Environmental and Sustainable Engineering, Arizona State University – CESE Research Advisory Committee. Appointed. **2011-2012**
– Department of Civil and Environmental Engineering, IAFSE, Arizona State University – Academic Affairs (Curriculum) Committee. Elected. **2008-2011**
– Department of Civil and Environmental Engineering, IAFSE, Arizona State University – Academic Affairs (Curriculum) Committee. Appointed. **2006 – 2008**
– American Society of Civil Engineers – Arizona Geotechnical Division (AzASCE) Subcommittee. **2006**
– Arizona Land Subsidence Group **2010-2020**
– Post-Tensioned Roundtable Group **2005-2010**

Advisor/Mentoring Activities:

– Advisor to Honors College students' thesis (latest: Sam Montano) **2019-Present**
– Arizona State University – Research Experience for Teachers, Research Experience for Undergraduates & Youth Scholar Summer Programs **2016-2020, 2022-2024**
– MetroTech high school, Phoenix, AZ - WTS International, Women in Transportation YOU Mentoring program **2012-2016**
– Arizona State University –Obama Scholars Mentor Program **2009-2015**
– Arizona State University – Barrett Honors College - Honors Disciplinary Faculty **2004-Present**

Other Associations:

- Member of The Chicano and Latino Faculty and Staff Association of Arizona State University - primary mission is the recruitment and retention of Hispanic students. **2006-2020**

PROFESSIONAL ASSOCIATIONS

Memberships

- Member of the International Geosynthetics Society **Since 2015**
- Member, Association of Environmental and Engineering Geologists - Arizona Section **Since 2009**
- Member, The International Association of Foundation Drilling (ADSC) **Since 2008**
- Member, American Society of Civil Engineers **Since 2007**
- Member, The International Society for Soil Mechanics and Geotechnical Eng. (ISSMGE) **Since 2007**
- Member, The Chicano and Latino Faculty and Staff Association of Arizona State University **2006-2020**
- Member, The Faculty Women Association of Arizona State University since 2006.
- Member, The United States Universities Council on Geotechnical Education and Research (USUCGER) **Since 2006**
- Registered **Professional Engineer**. Colombian National Professional Board of Engineering and Architecture. April 14, 1989. License # 17202-31908CLD. **Since 1989**

PERSONNEL - SYNERGISTIC ACTIVITIES – Outreach and Impact

k-12 Education

Leadership:

Associate Director for the National Center for Infrastructure Transformation. **2023-Present**

- Accomplishments in 2024 included a summer program for Research Experience for Teachers: Two participants.

Deputy Director for CBBG in charge of overviewing the Education, Diversity and Outreach Programs. **2015-Present**

- Over the span of eight years (2015-2023), we have organized 393 outreach events for K-14 audiences attended by more than 11,600 (10,502) students and over 4000 (4,052) teachers and college faculty members. Also, three summer programs for Young Scholars, Research Experience for Undergraduate Students and Teachers.
- STEM teachers. Outreach activities included events at the Arizona Science Center with over 80 teachers attending each year for the past five (5) years.
- Phoenix Indian Center Panel Discussion and lab tours. Public outreach for the CBBG. Native American high school students from the Phoenix Indian Center visited CBBG and toured the labs. 18 attendants. 3/3/16.
- Night of the Open Door. Public outreach activity about CBBG with a booth with demonstrations, videos, hands on activities for kids, families. 662 engaged participants. 2/27/16.
- DiscoverE Day. 466 students from 3rd to 8th grades engaged in liquefaction and surficial soil stabilization demos. 2/12/16
- Capitol Elementary School, Phoenix. 12/2/15. Presentation about CBBG and Geotechnical engineering to teachers.
- Participation in the Learning through Engineering Design and Practice program sponsored by NSF where students from 6th to 8th grades get involved in hands-on activities designed to introduce engineering concepts.
- Volunteer mentor in the WTS (Women in Transportation) YOU mentorship program - Transportation YOU is a hands-on, interactive, mentoring program that offers young girls ages 13-18 an introduction to a wide variety of transportation careers - See more at: http://www.transportationyou.org/

Broadening the Participation of Underrepresented Groups in Engineering

- Organized a Workshop panel on Graduate School for Hispanic minorities for the Society of Hispanic Professional Engineers (SHPE) Conference, October 30, 2019, Phoenix, AZ
- Mentoring three undergraduate students from minority populations: Limon Bogere, Oniya Silas and Jeremy Nez. 2018-2020
- Mentoring two undergraduate students from minority populations: Limon Bogere and Angela Egan. 2017
- Meeting with **Disability Resource Center** director Dr. Diane Garvey. 1/20/16
- Meeting with **Phoenix Indian Center** personnel for possible collaboration with CBBG activities. 12/15/15.
- Meeting with **Center for Gender Equity in Science and Technology** Director, Dr. Gabriel Escondrias for possible collaboration with CBBG activities. 12/9/15
- Mentor for the WTS International program for middle and high school girls ages 13-18 aimed at sparking their interest in transportation careers and encouraging them to take courses in math, science, and technology. 2013/2015.
- Actively involved with the Society of Hispanic Professional Engineers (SHPE) by giving talks to community college students about civil engineering. Examples include the talks to Estrella Mountain Community College. A letter from the Math teacher is included in the Supplemental material.
- Participation with Arizona State University's College of Engineering WISE (Women in Science and Engineering) Program as instructor for the WISE Investments program, wherein Jr. High and High School Counselors and Teachers participate in laboratories and other activities designed to introduce them and their students (minorities in general) to engineering.

- Actively involved with the Hispanic Research Center in the MGE@MSA (More Graduate Education @ Mountain State Alliance) program by giving talks aimed to attract minority students into engineering graduate programs. Examples include the research mentoring of undergraduate female students from Puerto Rico in biogeotechnology aiming to promote inter-disciplinary work; and invited talks to female students that are considering engineering graduate programs.
- Participation with the Office for Pan-American Initiatives at ASU by promoting education, research initiatives, and cooperative activities with Latin American countries, especially with Mexico.
- Liaison for the Department of Civil Engineering at ASU for the recruitment of graduate students under the CONACYT (National Council for Science and Technology for Mexico) program until 2009.
- Obama Scholars Faculty Mentor since 2009.

Contributions to Development and Refinement of Computation Methodologies and Algorithms for Problem Solving.

- Generation of models that incorporate environmental factors and soil property variability in airfield pavement design.
- Generation of a model that incorporates a stochastic evaluation of pavement design, which includes uncertainty of environmental factors and accuracy of soil properties.
- Generation of algorithms to represent unsaturated constitutive relationships and soils expansive potential as a function of material index properties.
- Enhancement of the Integrated Climatic Model as required to improve its moisture prediction capabilities under pavements; and the studies of environmental effects in pavement mix and structural design systems nationwide.

Development of Databases to Support Research and Education

- Generation of a database of unsaturated soil properties for more than 36,000 soils that has become the base for numerous research studies at national and international levels, and an important tool for reliability studies, pavement design, slabs-on-grade design practice and the use of geo-thermal systems for heating/cooling applications.

PERSONNEL - STUDENT SUPERVISION/MENTORING

Post-doctoral Supervision: 1

Ramadam Salim (2020-2022, 2023-2024)

Total Number of Graduate Students Advised: 104

Thesis Advisor Committee Chair or Co-Chair: A total of 37 students

13 Ph.D. students (4 current):

1. Kalani Madushani Rajamanthri (Chair, 2023-current)
2. Yasen Mousa Kashour (Chair, 2023-current)
3. Saleh Alothman (Co-Chair, 2022-current)
4. Shivangi Jain (Co-Chair, 2022-current)
5. Austin Olaiz (Chair, 2018-2022). Dissertation: A Bayesian Forecast Model for the Climatic Response of Unsaturated Soils.
6. Mohammad Mosawi (Chair, 2018-2022). Dissertation: Improved Analysis of the Influence of Subgrade Soils Susceptible to Shrink/Swell on Pavement Performance
7. Elizabeth Stallings (Co-chair, 2017-2021). Dissertation: Fluid Flow through Granular Soils Treated with Microbially Induced Desaturation and Precipitation
8. Hani Alharbi (Chair, 2017-2020, Shaqra University). Dissertation: Stabilization of Expansive Soil Using Plant-Extracted Silicate Solution
9. Ashley Evans (Co-chair, 2018, DiGioia Gray). Dissertation: Estimation of Pressuremeter Modulus from Shear Wave Velocity In the Sonoran Desert
10. Pughazvel Palanivelu (Chair, 2017, Geocomp). Dissertation: Investigation of Subgrade Moisture Flow Caused by Thermo-Hydro Gradients in Airfield Pavements
11. Daniel Rosenbalm (Chair, 2013, Ninyo & Moore). Dissertation: Volume Change Behavior of Expansive Soils due to Wetting and Drying Cycles
12. Mohammad Abbaszadeh (Co-chaired with Dr. S.L. Houston: 2011, MWH Americas Inc.). Dissertation: The Effect of Cracks on Unsaturated Flow and Volume Change Properties of Expansive Clays and Impacts on Foundation Performance.
13. Carlos Cary (Co-chaired with Dr. M.W. Witczak: 2011, Horizon Engineering Consulting). Dissertation: Pore Water Pressure Response of a Soil Subjected to Traffic Loading under Saturated and Unsaturated Conditions

17 M.Sc. students (1 current):

Mayank Bagtharia (current), Limon Bogere (2020), Ahmad Sayed Mostafa (2019), Rakshith Gowda (2016), Yutong Lu (2015-ACS Services), Zachery Shafer (2014-AECOM), Eddy Ramirez (2013-Western Technologies), Daniel Rosenbalm (2011-ASU), Ramadan Salim (2011-ASU), Maie El-Keshky (2011), Sean Jacquemin (2011-Tetra Tech), Gustavo Torres (2011-Colombia), Elham Hashem (2010-ASU), Jesse Graham (2010-Yakima, WA), Brian Amos (2009 – Speedie & Associates), Carlos Cary (2008 - ASU), Mohamed Arab (2008 - ASU)

7 M.S.E. students:

Jonathan Soto (current), Scott Morgan (2019), Daniel Rossman (2015), John Furniss (2015), Christina Buckle (2013-ECI), Jeff Rodgers (2013-Ninyo & Moore), Kiran Mohanraj (2007-Western Technologies, Co-chaired with Dr. Kamil Kaloush).

Thesis Advisor Committee Member: A total of 67 students.

22 Ph.D. students:

Yusheng Jiang (2024), Carlos Obando (2022), Kimberly Martin (2021), Sichuan Huang (2020), Daehyun Kim (2019), Jeff Vann (2019-Vann & Associates), Abdullah Almajed (2017-ASU CBBG), Xuan Wu (2017), Rouwen Liu (2017), Ali Fakih (2017), Angel Gutierrez (2016-ASU CBBG), Elham Bani Hashem (2013- MWH Americas Inc.), Anushree Bharadwaj (2013), Waleed Zeiada (2012-ASU), Mehdi Bakhshi (2011), Mohamed Arab (2011-Egypt), Abdullah Al-Sanad (2011-Kuwait), Maria Rodezno (2010-National Center for Asphalt Technology at Auburn University), Sonal Singhal (2010-United Arab Emirates), Krishna Biligiri (2008 - VTI: Swedish National Road and Transport Research Inst., Linköping, Sweden), Heather Dye (2008 – Tao Engineering Inc.), Natalia Perez (2006 - Mexican Institute of Transportation), Andres Sotil (2005 - Peru).

22 M.S. students:

Rajesh Dangi (2024), Jack Harker (2023), Juan Paez (2018), Devinne Ramirez (2018), Jake Andresen (2017), Eduardo Raudales (2016), Brian Knorr (2014), Zachery Heim (2014), Angel Gutierrez (2013-ASU), Matthew Olson (2013), Tina Pourshams (2013), Matild Dosa (2012), Joseph Walsh (2011), Kanyembo Katapa (2011), Zbigniew Czupak (2011), Jeff Schaper (2011-Quality Testing, LCC), Srivatsav Kandala (2009 - ASU), Smita Dwivedi (2008), Atish Nadkarni (2007 – AMEC), Sudheen Anantharaman (2007), Suresh Raghavendra (2003 – PBS&J), Andres Sotil (2002 – University de Piura-Peru).

21 M.S.E. students:

Joe Reilly (2021), Joel Ramirez (2020), Robin Cheng (2020), John Heck (2017), Jeff Fijalka (2013), Pugazhvel Thirthar Palanivelu (2012), Bhagirath Reddy Andapali (2012), Leroy Johnson (2012), Michael Fernandez (2012), Ali Fakih (2012), Derek Boland (2012 – ADOT), David Ramsey (2012), Patrick Montgomery (2012), Jose Miguel Rodriguez (2012), Zeljorad Maricic (2012 - GCTS), Naida Causevic (2010 - AMEC), Sterling Crandell (2010 - HDR), Jared Wegner (2007 – Kimley-Horn), Rama Sabat (2006), Maria Rodezno (2005), Heather Czupak (2005).

2 Honors students:

Samuel Montano (2024), Molly Pavey (2020)

Visiting Scholars:

Miriam DeLuca (2016-MS student from Polytechnical University of Turin, Italy), Farhad Salour (2013- PhD student from VTI, Sweden)

Undergraduate students that have worked under my Supervision: A total of 22 students:

Samuel Montano (2023-2024), Jeremy Nez (2018-2020), Oniya Silas (2018-2020), Sammy Alsohbe (2019), Austyn Howard (2018-2019), Angela Egan (2017-2018), Magdaleno Meza (2018-HON thesis), Limon Bogere (2018-ASU), Paulo Carvalho de Oliveira (2015-Brazil), Joshuah Contreras (2014 – MS student at ASU), Eddy Ramirez (2012 – Western Technologies), Robert Jarrett (2011-2012), Seth Plas (2010 – City of Mesa), Kuo Tian (2009-2010 – Research Center in Germany), Natalie Lopez (2007-2009), Sean Jacquemin (2009), Krishna Kilambi (2008), Berenice Barranco (B.S. in 2008 – Drake Cement LLC), Armando Fuentes (B.S. in 2008 – Arizona Department of Transportation), Leidy Feliz (MGE@MSA summer internship program, Universidad Metropolitana, Puerto Rico), Waleska Vasquez (MGE@MSA summer internship program, Universidad Metropolitana, Puerto Rico), Arianna Valle (B.S. in 2004 – University of California at Irvine)

High-School students that have worked under my Supervision: A total of **3 students**: Angela Egan, Limon Bogere and Oniya Silas (2016, 2018, 2019).

PERSONNEL - TEACHING APPOINTMENTS

Total of 74 courses taught with 2792 students (706 graduate students)

Associate Professor. School of Sustainable Eng. and the Built Environment, Arizona State University, Tempe, AZ. **2014-Present**

Courses Taught:

CEE 554 Shear Strength and Slope Stability (core), CEE 553 Advanced Soil Mechanics (core), CEE 551 Advanced Geotechnical Laboratory Testing (core), CEE 452 Foundations Design (senior elective), CEE 598 Geotechnical Aspects of Pavement Design, CEE598 Connecting Research to the Broader Community, CEE558 Unsaturated Soil Mechanics (core).

Honors Disciplinary Faculty. The Barrett Honors College, Arizona State University. Tempe, AZ.

– Mentorship of honors students by commitment of time, attention, and intellectual resources. **2006-Present**

Barak Obama Scholars Program

- Mentoring students in their first year of college **2009-2016**

Assistant Professor. School of Sustainable Engineering and the Built Environment, Arizona State University, Tempe, AZ. **2006-2013**

Courses Taught:

CEE 554 Shear Strength and Slope Stability (core), CEE 550 Soil Behavior (core), CEE 553 Advanced Soil Mechanics (core), CEE 551 Advanced Geotechnical Laboratory Testing (core), CEE 452 Foundations Design (senior elective), CEE 100 Introduction to Civil and Environmental Engineering (freshman core)

Faculty Research Associate, Ira A. Fulton School of Engineering, Arizona State University, Tempe, AZ. **2000-2006**

Courses Taught:

ECE 100 Introduction to Engineering Design, CEE 210 Engineering Mechanics I: Statics, CEE 296 Civil Engineering Systems

Teaching Assistant, Dep. of Civil and Env. Eng. & Del Webb School of Construction, Arizona State University, Tempe, AZ. **1996-1997**

Courses Taught:

CEE 351 – Introduction to Geotechnical Engineering (Lecture and laboratory), CEE 450 – Geotechnical Applications for Construction (Lecture and laboratory)

RESEARCH SUPPORT

Sponsored Research Funded

- Principal Investigator, USDOT, National Center for Infrastructure Transformation (NCIT), $4'000,000 (including matching funds), 35% recognition, 11/27/2023 – 11/26/2028.
- Principal Investigator, National Academy of Sciences, **NCHRP** Synthesis Project 53-18 – Moisture Measurements for Foundations and Slopes, $45,000, 100% recognition, 10/6/2022
- Principal Investigator, **US Army Corps**, Development of a Recommended Approach to Implement Environmental Effects into the New ERDC Pavement Design and Evaluation JED Programs, $149,853, 100% recognition, 7/31/2022.
- Principal Investigator, REU Site ASU sub-award, **NSF**, $70,327, in collaboration with UC Davis through CBBG, 2018, 100% recognition.
- Principal Investigator, National Academy of Sciences, **NCHRP** Project HR 01-59, Proposed Enhancements to Pavement ME Design: Improved Consideration of the Influence of Subgrade Soils Susceptible to Shrink/Swell and/or Frost Heave on Pavement Performance, $500,000, 2018, 100% recognition.
- Co-Investigator and Deputy Director, **National Science Foundation**, Engineering Center for Bio-Mediated and Bio-Inspired Geotechnics, $18'500,000, August 1st 2015 to July 31st, 2025, 12% recognition (FY 1,2,3), 10% recognition (FY4,5,6,7). PI: Ed Kavazanjian.
- CBBG Clay Stabilization and Control of Clay Swelling via Plant Extracted Silicate Solution, **NSF**, $40,000, Ed Kavazanjian (PI), 2017, 100% recognition.
- Supplemental Funding for Two Undergraduate Research Experience for Native Americans at New Mexico State University, **NSF**, $16,000 through CBBG, E. Kavazanjian (PI), 11/2017, 12% recognition FY 1-3, 10% recognition FY4.
- Supplemental Funding Request for Undergraduate Research Experience for Veterans, **NSF**, $30,000 through the CBBG, Ed Kavazanjian (PI), 2017, 12% recognition.
- REU supplemental to NSF, $30,000 through the CBBG, Ed Kavazanjian (PI), 05/16, 12% recognition.
- Principal Investigator, **Federal Aviation Administration**, Research Proposal for the Investigation of Subgrade Moisture Flow in an Airfield Pavement System, $250,732, August 1st, 2013 to August 1st, 2015, 100% recognition, Award # 13095239.
- Principal Investigator, Effectiveness of the EcSS 3000 Soil Stabilizer on Expansive Soils in Arizona, Environmental Soil Stabilization LLC, $6,006, Dec 1st, 2012 to March 31st, 2013, 100% recognition, Award #026205.
- Principal Investigator, Unsaturated Soil Modeling for Military Airfield Pavement Design, **US Air Force**, $25,000, Dec 1st , 2011 to August 31st, 2012, 100% recognition, Award # W9128F-10-D-0065.
- Co-I, Advancement of Unsaturated Soils Theory into the Undergraduate Civil Engineering Curriculum, **NSF** CCLI (Course Curriculum and Laboratory Improvement), $197,276. August 2011-July 2014. 30% recognition. Sponsor Award #1044012; ASU # 024812.
- Principal Investigator, Collaborative Research: SWCC Based Models for Realistic Simulation of Swell Behavior of Expansive Soils, **NSF**, $163,028. August 2010-July 2013. 60% recognition. Sponsor Award #1031238; ASU Award #023815-001; Acct #XCS0388.
- Principal Investigator, Project 09-23B, Integrating the National Database Subgrade Soil-Water Characteristic Curves and Soil Index Properties with the MEPDG, **NCHRP**, Awarded amount: $85,000. July 2010 to Oct 2011. 100% Recognition. Sponsor Award #HR 09-23B; ASU Award #023970-001; Acct #XCS0393.
- Co-Investigator, REU: Collaborative Research: Surface Flux for Cracked and Intact Clays for Ponded and Sloped Conditions. National Science Foundation. Awarded amount: $6,000. P.I.: Sandra Houston. January 2009 – October 2009. 50% Recognition. Sponsor Award #0825089; ASU Award #021035-002; Acct #XCS0304.
- Co-Investigator, Collaborative Research: Surface Flux for Cracked and Intact Clays for Ponded and Sloped Conditions. **National Science Foundation**. Awarded amount: $224,500. P.I.: Sandra Houston. July 2008 – June 2011. 30% Recognition. Sponsor Award #0825089; ASU Award #021035-001; Acct #XCS0269.
- Principal Investigator, 09-23A, Implementing a National Catalog of Subgrade Soil-Water Characteristic Curve (SWCC) Default Inputs for Use with the MEPDG, **NCHRP**, Awarded amount: $59,800. July 2008 to July 2009. 100% Recognition. Sponsor Award #HR 09-23A; ASU Award #021173-001; Acct #XCS0274.
- Principal Inv., Partnership with Industry to Advance Unsaturated Soil Mechanics. Hoque & Associates, Inc. Awarded amount: $11,500. 06/2007 to 05/2009. 100% Recognition. Sponsor Award #07129174; ASU Award #019358-001; Acct #XCS0206.
- Co-Investigator, Development and Implementation of the Mechanistic Empirical (M-E) Pavement Design Guide for Arizona, **Arizona Department of Transportation**. Awarded amount: $350,000, PI: Matthew Witczak. Jan. 2008 to Jan 2009. 25% Recognition. Sponsor Award #T07-49A-0037; ASU Award #020166-001; Account #XCS0228.

- Co-Investigator, Pavement Design Research towards the Implementation of the Mechanistic-Empirical Pavement Design Guide. **Maricopa Department of Transportation**. Awarded amount: $150,000. PI: Michael Mamlouk. May 2006 to May 2009. 50% Recognition. Sponsor Award #C6407161200; ASU Award #018757-001; Account #XCS0192.
- Co-Investigator, "A Study of the Performance of Slab on Grade Residential Foundations on Expansive Soils in Arizona", Home Builders Association of Central Arizona, HBACA. Awarded amount: $300,000. Completion date: 08/2006. 0% Recognition.
- Research Associate, "Foundation Engineering for Expansive Soils in the Phoenix Area" sponsored by Construction, Inspection and Testing Co. (CIT) and Geo-Lab Inc. Completion date: 2005.
- Research Associate, "Environmental Effects in Pavement Mix and Structural Design Systems. Validation of the Integrated Climatic Model with Data from the Long-Term Pavement Performance Seasonal Monitoring Program (LTPP SMP). (NCHRP 9-23) sponsored by the **Federal Highway Administration**. Completion date: 11/2006.
- Research Associate, "Development of the 2002 Design Guide for the Design of New and Rehabilitated Pavement Structures". (NCHRP 1-37 A) sponsored by the **Federal Highway Administration**. Validation of the moisture prediction of the Integrated Climatic Model (ICM) ver. 2.6. Completion date: 06/2004.
- Research Associate, "Development of Performance Related Specifications for Asphalt Pavements in the State of Arizona" sponsored by the Arizona Department of Transportation (**ADOT**). Completion date: 06/2004.