Milind V. Khire, Ph.D., P.E.
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Energy Production Infrastructure Center
Civil & Environmental Engineering
University of North Carolina, Charlotte
Charlotte, NC 28223

EDUCATION

- **Ph.D. in Civil & Environmental Engineering (Geoenvironmental)** *1995*
  University of Wisconsin-Madison
  Advisor: Prof. Craig H. Benson, NAE
- **M.S. in Civil & Architectural Engineering (Geotechnical)** *1992*
  University of Miami, Florida
  Advisor: Prof. Evert Lawton
- **B.E. in Civil & Sanitary Engineering** *1988*
  University of Bombay, Mumbai, India

MAJOR AWARDS

- **Alpha Award (2011)**, Innovation in Engineering and Technology Related to Waste Containment, Engineering Society of Detroit (ESD)
- **Lilly Teaching Fellowship**, Michigan State University, 2006-2007
- **Exemplary Service Award**, American Society of Civil Engineers, 2006
- **Croes Medal**, American Society of Civil Engineers, 1998
- **Severson Geotechnical Award**, University of Wisconsin – Madison, 1995

PROFESSIONAL HISTORY

University of North Carolina at Charlotte, Dept. of Civil & Env. Engineering
Professor (Tenured) *2014 - now*

Michigan State University, Dept. of Civil & Environmental Engineering
Associate Professor (Tenured) *2008 - 2014*

Michigan State University, Dept. of Civil & Environmental Engineering
Assistant Professor *2002 - 2007*

Tonkin & Taylor Engr. Consultants, Auckland, New Zealand
Senior Geoenvironmental Engineer *1999 - 01*

GeoSyntec Consultants, Boca Raton, Florida
Assistant Project Engineer → Project Engineer *1995 - 99*

University of Wisconsin-Madison
Research/Teaching Assistant *1991 - 95*

KEY TECHNICAL EXPERTISE AND RESEARCH INTERESTS

- **Field-scale testing** of earthen systems and coal ash and municipal solid waste landfills
- **Hydraulic** properties of soil, coal combustion byproducts and municipal solid waste
- **Electrochemical** treatment of flowback water from fracking
- Hydrology of **Green Roofs**

SELECTIVE FUNDED RESEARCH GRANTS

NSF And Other Government Organizations

1. **Title**: Technical Review and Strategic Planning Services North Carolina Coal Ash Management ***(Principal Investigator)***
   Sponsor: *North Carolina Coal Ash Management Commission*
   Co-PI: Chris Hardin (Civil & Environmental Engineering)
   Duration: 6/1/2014 to 5/31/2016
   Budget: $90,000

2. **Title**: Predictive Modeling of Freezing and Thawing of Frost-Susceptible Soils ***(Principal Investigator)***
   Sponsor: *Michigan Department of Transportation (MDOT)*
   Co-PI: Gilbert Baladi (Civil & Environmental Engineering)
   Duration: 10/1/2012 to 9/31/2014
   Budget: $100,000

3. **Title**: A Lattice Boltzmann-based Model for Predicting Unsaturated Flow through Soil Macropores and Capillary Pores ***(Principal Investigator)***
   Sponsor: ***National Science Foundation***
   Co-PI: Emin Kutay (Civil & Environmental Engineering)
   Duration: 4/1/2011 to 3/31/2014
   Budget: $212,000

4. **Title**: Sensing, Analyzing and Forecasting Evaluation (SAFE) System for Bioreactor Landfills ***(Principal Investigator)***
   Sponsor: ***National Science Foundation***
   Duration: 9/15/2005 to 8/31/2009
   Budget: $265,000 (Including IREE + other supplements)

5. **Title**: SGER: Lab-Scale Evaluation of Electrochemical Remediation of Contaminated Clayey Soils using Alternating Current **(*Principal Investigator*)**
   Sponsor: ***National Science Foundation***
   Co-PI: Satish Udpa (Dean, College of Engineering)
   Duration: 1/1/2004 to 12/31/2006
   Budget: $101,000

6. **Title**: Evaluation of Landfill Gas Emissions from an Instrumented Final Cap of a Bioreactor Landfill Cell **(*Principal Investigator*)**
   Sponsor: ***National Science Foundation***
   Co-PIs: S. Hashsham & T. Voice (Civil & Environmental Engineering)
   Duration: 7/1/2003 to 12/31/2006
   Budget: $70,000

7. **Title**: Stability Assessment and Field-Scale Monitoring of PVC Sheet Pile Wall Containing Arsenic Contaminated Backfill ***(Principal Investigator)***
   Sponsor: *State of Michigan Department of Environmental Quality (MDEQ)*
   Co-PI: None
   Duration: 12/1/2010 to 6/30/2012
   Budget: $120,000

Nonprofit Organizations

8. **Title**: Geoclimatic Design of Alternative Final Covers for Municipal Solid Waste Landfills in Texas ***(Principal Investigator)***
   Sponsor: *TxSWANA (representing a consortium of landfill operators)*
   Co-PI: None
   Duration: 8/15/2012 to 08/15/2014
   Budget: $220,000

9. **Title**: Moisture Consumption during Methane Generation in MSW Landfills ***(Principal Investigator)***
   Sponsor: *Environmental Research & Education Foundation*
   Co-PI: None
   Duration: 8/1/2009 to 7/31/2010
   Budget: $20,000

10. **Title**: Field-Scale Assessment of Evapotranspirative Methane Oxidation (ETMO) Caps for Sustainable Management of MSW Landfills in Sub-Humid Climates ***(Principal Investigator)***
    Sponsor: *Environmental Research & Education Foundation*
    Co-PI: None
    Duration: 10/1/2007 to 9/30/2009
    Budget: $145,000

11. **Title**: Estimation of Field-Scale Thermal Properties of Bioreactor Landfills for Optimum Performance ***(Principal Investigator)***
    Sponsor: *Environmental Research & Education Foundation (EREF)*
    Duration: 9/1/2005 to 8/31/2007
    Co-PI: None
    Budget: $54,000

12. **Title**: Field-Scale Testing of Granular Blankets for Leachate Recirculation and Monitoring of Hydraulic Performance of Bioreactor Landfills ***(Principal Investigator)***

Sponsor: *Environmental Research & Education Foundation (EREF)* and *Waste Management, Inc*
Co-PI: None
Duration: 2/1/2004 to 1/31/2007
Budget: $70,000

13. **Title**: Field-Scale Evaluation of Bioreactor Landfill Technology **(*Co-Principal Investigator*)**
Sponsor: *Environmental Research & Education Foundation*
Duration: 6/18/2001 to 5/30/2004
Budget: $207,000

Private Sector

14. **Title**: State of Practice Review for Coal Combustion Residue (CCR) Landfills
(Principal Investigator)
Sponsor: *Southern Company*
Duration: 6/1/2015 to 12/31/2015
Budget: $35,000

15. **Title**: Field-Scale Testing of Hydrology of Water Balance Covers
(Principal Investigator)
Sponsor: *Waste Management, Inc.*
Duration: 1/1/2014 to 12/31/2016
Budget: $125,000

16. **Title**: Computational Modeling: bench-scale, pilot-scale, and full-scale ash/gypsum/wastewater mixtures in support of zero liquid discharge Applications
(Principal Investigator)
Sponsor: *Southern Company*
Co-PIs: William Langley & John Daniels (Civil & Environmental Engineering)
Duration: 6/1/2014 to 8/31/2015
Budget: $99,500

17. **Title**: Meso-Scale Testing of Solidification/Stabilization of Flue Gas Desulfurization Waste Water ***(Co- Principal Investigator)***
Sponsor: *Duke Energy Corporation*
PI: Vincent Ogunro (Civil & Environmental Engineering)
Duration: 7/1/2014 to 7/31/2016
Budget: $225,000

18. **Title**: Field-Scale Evaluation of Surface Runoff from Instrumented Landfill Cover in Texas ***(Principal Investigator)***
Sponsor: *Waste Management, Inc.*
Co-PI: None
Duration: 1/1/2011 to 8/31/2014

Budget: $150,000

19. **Title**: Field-Scale Evaluation of Evapotranspirative Caps for Landfills in Michigan ***(Principal Investigator)***
    Sponsor: *Waste Management, Inc.*
    Co-PI: None
    Duration: 11/1/2010 to 12/31/2013
    Budget: $ 166,000

20. **Title**: Development of Aeration Strategy for Elevating Temperature in a Bioreactor Landfill ***(Co-Principal Investigator)***
    Sponsor: *Waste Management, Inc.*
    Duration: 3/1/2004 to 4/30/2006
    Budget: $97,000

21. **Title**: Field-Scale Testing of Leachate Recirculation Blankets made up of Recycled Granular Materials **(*Principal Investigator*)**
    Sponsor: *Waste Management, Inc.*
    Co-PI: None
    Duration: 12/1/2002 to 1/31/2004
    Budget: $40,000

Intramural

22. **Title**: Teaching Geo-Environmental Courses using an Interactive Scale Model (Lilly Teaching Fellowship)
    Sponsor: *Michigan State University*
    Duration: 8/1/2006 to 7/31/2007
    Budget: $7,000

TOTAL FUNDING: $5.2M

PROFESSIONAL SERVICE

- Associate Co-Editor of ASCE Journal of Hazardous, Toxic, and Radioactive Waste Mgmt (Special Issue: Bioreactor Landfills, 2013)
- Technical Program Co-Chair**,** *GeoCongress 2008*, ASCE Geo-Institute, March, 2008, New Orleans.
- Editorial Board Member, *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE (2002-2006).
- Technical Session Co-Chair, *GeoCongress 2012*, *GeoCongress2014*
- Technical Session Co-Chair (***Landfills***), *GeoFlorida 2010*
- Technical Committee Member, Global Waste Management Symposium, (2012)
- Technical Committee Member, Global Waste Management Symposium, (2010)
- Technical Committee Member, Global Waste Management Symposium, (2008)
- Technical Committee Member, Engineering Society of Detroit (ESD) Annual Solid Waste Technical Conference (2007 to now).
- Proposal Panelist, NSF, CMMI, Geoenvironmental and Geohazards Program, 2009
- Proposal Panelist, NSF, CMMI, Geoenvironmental and Geohazards Program, 2007
- Proposal Panelist, NSF, CMMI, Geoenvironmental and Geohazards Program, 2005
- Proposal Panelist, DOE, Environmental Science and Technology Program, 2005.
- Proposal Panelist for EPA's SBIR – Phase I Grant Program, 2003.
- Proposal Reviewer for U.S. Civilian Research & Development Foundation (CRDF)
- Reviewer of over 100 technical manuscripts submitted to ASCE's *Journal of Geotechnical & Geoenvironmental Engineering*, *Journal of Environmental Engineering*, and *Journal of Hydrologic Engineering*.
- Reviewer for *Canadian Geotechnical Journal* and *Geotechnical and Geological Engineering Journal* (Springer).
- Reviewer for *Waste Management & Research and Waste Management (Elsevier).*
- Task Force Committee Member on Geo-environmental Engineering, Geo-Institute, ASCE (since 2002).
- Technical reviewer for *GeoFrontiers'05*, *GeoCongress'06*, *GeoDenver'07*, *GeoCongress 2008*, *GeoFlorida2010*, *GeoFrontiers2011*, and *GeoCongress2012*.
- Technical reviewer for 8th International Conference on Geosynthetics, Japan.
- Technical reviewer for other geoenvironmental and environmental conferences.

INSTITUTIONAL SERVICE

- College of Engineering, Reappointment, Promotion, and Tenure (RPT) Committee, UNC, Charlotte (2014-15).
- Chair of Environmental Engineering Faculty Search Committee, UNC, Charlotte (2014-15).

- Chair of Marketing Committee, Civil & Environmental Engineering, UNC, Charlotte (2014-15).
- MSU American Society of Civil Engineers (ASCE) and American General Contractors (AGC) Chapter Advisor (2008 to 2012) – advised over 300 students and worked with local and national industries for fundraising.
- Chair, Graduate Studies Committee, Civil & Environmental Engineering, 2010-date.
- Chair, Engineering Graduate Studies Committee, College of Engineering, 2012-date.
- Technical advisor of **GeoChallenge 2010** and **2011** Teams which were selected to compete at the Nationals.
- University Grievance Panel, 2012.
- Chair, Faculty Search Committee for Departmental Technologist Position, 2011.
- Undergraduate Awards Committee Rep., College of Engineering, 2002-2004.
- CEE Dept. Rep., College of Engr. Library Committee, 2005 to 2006.
- CEE Dept. Rep., College of Engr. Task Force for Graduate Research, 2005 to 2007.

SELECTIVE OUTREACH ACTIVITIES

- Served as a technical consultant for Technical Outreach Services for Communities (TOSC) program at MSU sponsored by U.S. EPA (2002-2004). Visited the neighborhood community of EnviroSafe Site near Toledo, Ohio and Indiana Harbor Canal in Northern Indiana and carried out outreach activities related to contaminated ground water and contaminated sediment dredging impacts.
- Carried out geotechnical and geoenvironmental "hands on" projects during 2005 to 2009 for High School Engineering Institute (HSEI) at MSU, a week-long summer training camp for high school students.
- Carried out geoenvironmental "hands on" projects during 2005 to 2009 for Women in Engineering (WIE) camps held at MSU, a summer training program for female high school students.
- Carried out geoenvironmental "hands on" projects during 2007 for Grandparents University held at MSU, a summer training program for middle school students attending with their parents or grandparents.

PROFESSIONAL SHORT COURSES AND WEBINARS

- "Alternative Final Covers 101: Design Fundamentals and Field-Scale Testing" (Invited Webinar Organized by EREF) – 15 Jan 2015.
- "Water Balance Covers for Landfills & Mine Sites" (managed by USEPA, Steve Rock) (Co-Instructor) – May 2011, Denver, CO.
- "Engineering Design of Bioreactor Landfills," managed by ASCE, Co-Instructed with Dr. Xuede Qian) – Orlando, June 2011.
- "Geotechnical Aspects of Bioreactor Landfills" (managed by ASCE, Co-Instructed with Dr. Xuede Qian) – Multiple Offerings in the U.S. during 2005-2009.

- "Alternative Final Covers" (managed by ITRC, Steve Rock) (Co-Instructed with Drs. Benson and Albright) – April 2010, Austin, TX.
- "Design of Bioreactor Landfills," Instructed for Eco Designs, 5 Jan. 2009, Mumbai, India.
- "Design of Liquid Injection and Gas Collection Systems for Landfills," Co-Instructed with Profs. Benson and Barlaz and Senior Personnel of Golder Associates, 17-18 Jan 2008, Atlanta.
- "Design of Bioreactor Landfills," University of Santander, Spain, June 2008.
- "Alternative Final Covers" (managed by ESD) (Co-Instructed with Dr. Benson, Terry Johnson, and Bill Schnabel) – Oct. 2007, E. Lansing, MI.

COURSES TAUGHT

MICHIGAN STATE UNIVERSITY

- CE 271: Introduction to Civil Engineering (Co-Instructor for Geotechnical Project)
- CE 312: Soil Mechanics (4 credit-hour undergraduate course with lab sections)
- CE 485: Landfill Design (a senior-level 3 credit-hour design course)
- CE 495: Senior Design (Co-Instructor for Geoenvironmental Project)
- ENE 800: Environmental Engineering Graduate Seminar (Course Coordinator)
- CE 812: Properties of Soils (a 3 credit-hour lab-based graduate course)
- CE 815: Slope Stability and Stabilization Methods (a 3 credit-hour graduate course)

UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE

- CEGR 4264/5364: Landfill Design and Site Remediation

PUBLICATION CITATION INDICES

- Google Scholar: **I10-Index: 22; 1,020 citations**

LIST OF PUBLICATIONS

Refereed Archival Journal Papers

1. Reddy, R., Kulkarni, H. and **Khire, M.** (2013), "Two Phase Modeling of Leachate Recirculation Using Vertical Wells in Bioreactor Landfills," *Journal of Hazardous, Toxic, and Radioactive Waste Mgmt,* American Society of Civil Engineers, 17(4), 272–284..

2. Mijares, R. and **Khire, M.** (2012), "Field Data and Numerical Modeling of Water Balance of Lysimeter vs. Actual Earthen Cap," *Journal of Geotechnical & Geoenvironmental Engineering,* American Society of Civil Engineers, 138(8): 889-897.

3. Mukherjee, M. and **Khire, M.** (2012), "Instrumented Large-Scale Subsurface Liquid Injection Model for Bioreactor Landfills," *Geotechnical Testing Journal,* ASTM, 35(1): 1-10.

4. Mijares, R., **Khire, M.**, and Johnson, T. (2012), "Field-Scale Evaluation of Lysimeters versus Actual Earthen Covers," *Geotechnical Testing Journal,* ASTM, 35(1): 41-50.

5. Mijares, R. and **Khire, M.** (2011), "Evaluation of Geosynthetic Capillary Break in Earthen Cover Lysimeters," *Journal of Geotechnical & Geoenvironmental Engineering,* American Society of Civil Engineers, in review/revision.

6. Mohtar, C. and **Khire, M**. (2009), "Vertical Pullout Test to Measure Interface Friction between Coarse-Grained Soils and Geomembranes," *Geotechnical Testing Journal,* ASTM, 32(4), 365-371.

7. Cabaraban, M., and **Khire, M.**, and Alocilja, E. (2008), "Aerobic In-Vessel Composting versus Bioreactor Landfilling using Life Cycle Inventory Models," *Clean Technologies and Environmental Policy Journal*, Springer-Verlag, 10(1): 39-52.

8. Zhao, X, Musleh, R, Maher, S, **Khire, M**, Voice, T, and Hashsham, S. (2008), "Start-up Performance of a Full-Scale Bioreactor Landfill Cell under Cold-Climate Conditions," *Waste Management*, Elsevier, 28(12), 2623-2634.

10. Pepprah, E. and **Khire, M**. (2008), "Electroremediation of Naphthalene in Aqueous Solution using Alternating and Direct Currents," *Journal of Environmental Engineering,* American Society of Civil Engineers, Vol. 134, No. 1, 32-41.

11. **Khire, M.** and Mukherjee, M. (2007), "Leachate Injection Using Vertical Wells in Engineered Landfills," *Waste Management,* Elsevier, Vol. 27, No. 9, 1233-1247.

12. Haydar, M. and **Khire, M**. (2007), "Leachate Recirculation in Bioreactor Landfills using Permeable Blankets," *Journal of Geotechnical & Geoenvironmental Engineering,* American Society of Civil Engineers, Vol. 133, No. 4, 360-371.

13. **Khire, M.** and Haydar, M. (2007), "Leachate Recirculation in Engineered Bioreactor Landfills Using Geocomposite Drainage Material," *Journal of Geotechnical & Geoenvironmental Engineering,* American Society of Civil Engineers, Vol. 133, No. 2, 166-174.

14. Haydar, M. and **Khire, M.** (2006), "Geotechnical Sensor System to Monitor Injected Liquids in Landfills," *Geotechnical Testing Journal,* American Society of Testing of Materials, Vol. 29, No.1, 37-44.

15. Haydar, M. and **Khire, M.** (2005), "Leachate Recirculation Using Horizontal Trenches in Bioreactor Landfills," *Journal of Geotechnical & Geoenvironmental Engineering,* American Society of Civil Engineers, Vol. 131, No. 7, 837-847.

16. Gueorguieva, S., **Khire, M.,** and Petrova, R. (2005), "Implementing Evapotranspirative Cover Method at Old Landfills in Bulgaria," *Forest Science,* Vol. 4, 1-12.

17. Haydar, M., and **Khire, M.** (2004), "Numerical Evaluation of Heterogeneity and Anisotropy of Waste Properties on Leachate Recirculation in Bioreactor Landfills," *Journal of Solid Waste Management & Technology,* Vol. 30, No. 4, 233- 242.

18. **Khire, M.**, Benson, C., and Bosscher, P. (2000), "Capillary Barriers in Semi-Arid and Arid Climates: Design Variables and the Water Balance," *Journal of Geotechnical and Geoenvironmental Engineering*, American Society of Civil Engineers, Vol. 126, No.8, 695-708.

19. **Khire, M.** , Benson, C., and Bosscher, P. (1999), "Capillary Barriers in Semi-Arid and Arid Climates: Field Data & Model Predictions Made with UNSAT-H," *Journal of Geotechnical and Geoenvironmental Engineering*, American Society of Civil Engineers, Vol. 125, No. 6, 518-527.

20. **Khire, M.**, Benson, C., and Bosscher, P. (1997), "Water Balance Modeling of Final Covers," *Journal of Geotechnical and Geoenvironmental Engineering*, American Society of Civil Engineers, Vol. 123, No.8, 744-754.

21. **Khire, M**., Benson, C., and Bosscher, P. (1997), "Water Balance of Two Earthen Landfill Caps in a Semi-Arid Climate," *Journal of Land Contamination and Reclamation*, Vol. 5, No. 3, 195-201.

22. Giroud, J., **Khire, M.**, and Soderman, K. (1997), "Liquid Migration through Defects of a Geomembrane Overlain and Underlain by a Permeable Media," *Geosynthetic International*, International Geosynthetics Society, Vol. 4, Nos. 3-4, 293-321.

23. Giroud, J., **Khire, M.**, and McKelvey, J. (1997), "Evaluation of the Rate of Leachate Migration through a Defect of a Geomembrane Placed on a Semi-Permeable Soil," *Geosynthetic International*, International Geosynthetics Society, Vol. 4, Nos. 3-4, 323-334.

24. Giroud, J., King, T., Sanglerat, T., Hadj-Hamou, T., and **Khire, M.** (1997), "Rate of Leachate Migration through Defects in a Geomembrane Placed on a Semi-Permeable Medium," *Geosynthetic International*, International Geosynthetics Society, Vol. 4, Nos. 3-4, 349-372.

25. Meerdink, J., Benson, C., and **Khire, M.** (1996), "Unsaturated Hydraulic Conductivity of Two Compacted Barrier Soils," *Journal of Geotechnical and Geoenvironmental Engineering*, American Society of Civil Engineers, Vol. 122, No. 7, 565-575.

26. Benson, C., and **Khire M.** (1994), "Reinforcement of Soils with Strips of Reclaimed High Density Polyethylene," *Journal of Geotechnical Engineering*, American Society of Civil Engineers, 120(5), 838-855.

27. Lawton, L., **Khire, M.,** and N. Fox (1993), "Reinforcement of Soils by Multi-Oriented Geosynthetic Inclusions," *Journal of Geotechnical Engineering*, American Society of Civil Engineers, 119(2), 257-275.

Peer Reviewed Conference Papers

28. **Khire, M.**, Duraisamy, S., Verwiel, M., Prucha, C., and Johnson, T (2015). "Stormwater Filtration using Sand vs. Synthetic Fibers," *IFCEE 2015*, San Antonio, 17-21 Mar, pp. 2826-2835.

29. Duraisamy, S. and **Khire, M.** (2015). "Macropore Flow Modeling using the Root Zone Water Quality Model," *IFCEE 2015*, San Antonio, 17-21 Mar, pp. 2667-2676.

30. Kaushik, T., **Khire, M.,** Johnson, T., and Caldwell, M. (2014), "Surface Runoff at an Instrumented Catchment Scale Water Balance Final Cover," *GeoCongress 2014*, ASCE Geotechnical Special Publication No. 227, Atlanta, 24-26 Feb.

31. Duraisamy, S. and, **Khire, M.** (2014), "Controlled Irrigation to Estimate Field-Scale Hydraulic Conductivity of a Landfill Final Cover," *GeoCongress 2014*, ASCE Geotechnical Special Publication No. 227, Atlanta, 24-26 Feb.

32. Duraisamy, S. and, **Khire, M.** (2014), "Field-Scale Unsaturated Hydraulic Properties of Compacted and Uncompacted Earthen Covers," *GeoCongress 2014*, ASCE Geotechnical Special Publication No. 227, Atlanta, 24-26 Feb.

33. **Khire, M**. and Saravanathiiban, D. (2013). "Micropore vs. macropore flow: Implications for landfill final cover design." *Proceedings of Coupled Phenomenon in Environmental Geotechnics*, Torino, May.

34. **Khire, M.** and Saravanathiiban, D. (2012), "Centrifuge Testing of Unsaturated Hydraulic Properties of Municipal Solid Waste," *GeoCongress 2012*, ASCE Geotechnical Special Publication No. 225: Geotechnical Engineering State of the Art and Practice, Oakland, CA, 27-29 March.

35. **Khire, M.** and Kaushik, T. (2012), "Experimental and Numerical Evaluation of Liquid Injection using Horizontal Trench System for Bioreactor Landfills," *GeoCongress 2012*, ASCE Geotechnical Special Publication No. 225: Geotechnical Engineering State of the Art and Practice, Oakland, CA, 27-29 March.

36. **Khire**, **M**. and Seo, C. (2010), "**Electrochemical** degradation of MTBE using Direct and Alternating Currents," Plenary Lecture, *Proceedings of the 6th International Congress on Environmental Geotechnics*, New Delhi, India, Nov 2010.

37. Mijares, R. G. and **Khire, M.** (2010), "Soil water characteristic curves of compacted clay subjected to multiple wetting and drying cycles," ASCE Geotechnical Special

Publication No. 199: Advances in Analysis, Modeling and Design, Reston, VA., 400-409.

38. Mijares, R. G., **Khire, M.**, and Johnson, T. (2010), "Lysimeters versus actual earthen caps: Numerical assessment of soil water storage," ASCE Geotechnical Special Publication No. 199: Advances in Analysis, Modeling and Design, Reston, VA., 2849-2858.

39. Staub, M., Galietti, Oxarango, L., **Khire, M**., and Gourc, J-P (2009), "Porosity and Hydraulic Conductivity of MSW using Laboratory-Scale Tests," *Proceedings of Third International Workshop on Hydro-Physico-Mechanics of Landfills,* Braunschweig, Germany, 10-13 Mar.

40. **Khire, M.** and Mijares, M. (2008), "Influence of Waste Layer on Percolation Estimates for Earthen Caps in Sub-Humid Climates," *GeoCongress 2008,* American Society of Civil Engineers, New Orleans, LA, 9-12 March.

41. **Khire, M.** and Pepprah, E. (2008), "Degradation of Naphthalene in Aqueous Phase of Saturated Ottawa Sand using Alternating and Direct Currents," *GeoCongress 2008,* American Society of Civil Engineers, New Orleans, LA, 9-12 March.

42. Mukherjee, M, **Khire, M.**, and Qian, X. (2008), "Lab-scale Liquid Injection Model of Bioreactor Landfill," *GeoCongress 2008,* American Society of Civil Engineers, New Orleans, LA, 9-12 March.

43. **Khire, M.** and Mukherjee, M. (2008), "Numerical Modeling of Hydraulic behavior of Bioreactor Landfills," *Proceedings of 1st European Conference on Unsaturated Soils (E-UNSAT 2008),* Durham, U.K, 2-4 July.

44. Pepprah, E, Birk, S., Liedl, R., and **Khire**, **M**. (2005), "Void Evolution in Soluble Rocks Beneath Dams Under Limited Flow Condition," *Sinkholes and the Engineering and Environmental Impacts of Karst*, ASCE Special Publication, ISBN: 0-7844-0796-7, 103-113.

45. **Khire, M.** and Haydar, M. (2005), "Leachate Recirculation Using Geocomposite Drainage Layer in Engineered MSW Landfills," Geotechnical Special Publications 130-142 & GRI-18; American Society of Civil Engineers, Proceedings of the *Geo-Frontiers 2005 Congress*, 24-26 Jan.

46. **Khire, M.**, Meerdink, J., Benson, C., and Bosscher, P. (1995), "Unsaturated Hydraulic Conductivity and Water Balance Predictions for Earthen Landfill Final Covers," *National Convention on Soil Suction Applications in Geotechnical Engineering Practice*, American Society of Civil Engineers, Geotechnical Special Publication No. 48, 38-57.

47. Benson, C. and **Khire M.** (1995), "Earthen Covers for Semi-Arid and Arid Climates," *National Convention on Landfill Closures-Environmental Protection and Land Recovery*, American Society of Civil Engineers, Geotechnical Special Publication No. 53, 201-217.

48. Giroud, J., Soderman, K., **Khire, M**., and Badu-Tweneboah, K. (1998), "New Developments in Landfill Liner Leakage Evaluation," *Proceedings of the Sixth International Conference on Geosynthetics*, Vol. 1, Atlanta, Georgia, USA, March, 261-268.

49. Benson, C. and **Khire M.** (1993), "Reinforcement of Soils with Strips of Reclaimed HDPE," *Proceeding of GeoSynthetics'93*, International Geosynthetics Society, 935-948.

Edited Books

50. **Khire, M.**, Alshawabkeh, A., and Reddy, K (Editors) (2008), "GeoCongress 2008: Geotechnics of Waste Management and Remediation," ASCE Geotechnical Special Publication No. 177, ASCE Press, Reston, Virginia.

51. Reddy, K., **Khire, M.**, and Alshawabkeh, A. (Editors) (2008), "GeoCongress 2008: Geosustainability and Geohazard Mitigation," ASCE Geotechnical Special Publication No. 178, ASCE Press, Reston, Virginia.

52. Alshawabkeh, A., Reddy, K., and **Khire, M.** (Editors) (2008), "GeoCongress 2008: Characterization, Monitoring, and, Modeling of GeoSystems," ASCE Geotechnical Special Publication No. 179, ASCE Press, Reston, Virginia.

Other Published Conference Papers

53. **Khire, M.** and Saravanathiiban (2014), "Micropore vs. Macropore Flow: Design Implications for Earthen Landfill Covers," *Proceedings ICLRS 2014*, Crystal River, FL. 19-22 Oct.

54. Kaushik, T. and **Khire, M.** (2012), "Experimental and Numerical Evaluation of Dual Phase Flow during Liquid Injection in a Coarse Sand," *Proceedings of TOUGH Symposium 2012*, Lawrence Berkley National Laboratory, Berkeley, 17-19 Sep.

55. **Khire, M.**, Saravanathiiban, D., Kaushik, T., Johnson, T. and Dwyer, S. (2012), "Estimation of Vertical Flux in an Instrumented Earthen Cover," *Proceedings 2012 Global Waste Management Symposium*, Phoenix, AZ.

56. **Khire, M.**, Kaushik, T. and Saravanathiiban, D. (2012), "Centrifuge Testing of Unsaturated Hydraulic Properties of MSW and Implications for Long-Term Leachate Flow," *Proceedings 2012 Global Waste Management Symposium*, Phoenix, AZ.

57. **Khire, M.** and Mijares, R. G. (2010), "Effect of Geocomposite Drainage Layer on Water Balance of Earthen Cover Lysimeters," *Proceedings 2010 Global Waste Management Symposium,* San Antonio, TX.

58. **Khire, M.** and Mijares, R. G. (2008), "Thermal and Hydraulic Modeling of Liquid Injection in an Instrumented Landfill Model," *Proceedings 2008 Global Waste Management Symposium*, Copper Mountain, CO, 7-10 Sep.

59. Mukherjee, M and **Khire, M**. (2007), "Injection of Liquids in Bioreactor Landfills," *Proceedings of International Conference*, 150th Anniversary celebration of Dept. of Civil Engineering, BESU, CENeM2007, Calcutta, 11-14 Jan.

60. **Khire, M.**, Haydar, M., and Mukherjee, M. (2006), "Liquid Head on Landfill Liners Due to Leachate Recirculation," *Proceedings of GeoCongress 2006,* American Society of Civil Engineers, Atlanta, GA, Feb. 26-Mar. 1.

61. **Khire, M.** and Pepprah, E. (2006), "Reactive Permeable Blankets for Cleanup of Contaminated Liquids," *Proceedings of GeoCongress 2006,* American Society of Civil Engineers, Atlanta, GA, Feb. 26-Mar. 1.

62. Milke, M. and **Khire, M.** (2006), "Use of Gas Flux to Infer Well Capture Effectiveness," *Proceedings of Intercontinental Landfill Research Symposium 2006,* Giallevare, Sweden, 12-14 June.

63. **Khire, M.** and Mukherjee, M. (2006), "Sensing System for Evaluation of Field-Scale Hydraulic Conductivity of Waste," Proceedings of *Intercontinental Landfill Research Symposium 2006,* Giallivare, Sweden, 12-14 June.

64. **Khire, M**. (2005), "Field-Scale Performance of Liquid Injection in a Landfill Using Permeable Blankets," *International Symposium on Soil & Groundwater Environment,* Korean Society of Soil and Groundwater Environment, Seoul, 27-28 Oct.

65. **Khire, M**. and Yellayi, A. (2005), "Field-Scale Evaluation of Landfill Gas Emissions from Instrumented Landfill Bioreactor Cell," *International Symposium on Soil & Groundwater Environment*, Korean Society of Soil and Groundwater Environment, Seoul, 27-28 Oct.

66. Haydar, M., **Khire, M.,** and Zhao X. (2004), "Field-Scale Testing of Leachate Recirculation Blanket Made Up of Scrap Tires at an MSW Landfill," *Proceedings of the Nineteenth International Conference on Solid Waste Technology and Management,* Philadelphia, March.

67. Haydar, M. and **Khire, M.** (2004), "Numerical Evaluation of Anisotropy and Heterogeneity of Waste Hydraulic Conductivity on Leachate Recirculation in MSW Landfills," *Proceedings of the Nineteenth International Conference on Solid Waste Technology and Management,* Philadelphia, March.

68. Zhao, X., Voice, T. **Khire, M.**, Musleh, R., Maher, S. and Hashsham, S. (2004), "Full-scale evaluation of bioreactor landfill technology," *Proceedings of SWANA 9th Annual Landfill Symposium*, Monterey, CA, June.

69. **Khire, M.**, and Haydar, M. (2003), "Numerical Evaluation of Granular Blankets for Leachate Recirculation in MSW Landfills," *Proceedings of the Ninth Sardinia Solid Waste Conference*, Cagliary, Oct.

70. Voice, T., S. Hashsham, S., **Khire, M.**, Maher, S., Musleh, R. and Zhao, Z. (2003), "Full-scale Evaluation of Bioreactor Landfill Technology," Presented at 8th Conference on Environmental Science and Technology, Lemnos Island, Greece, 8-10 Sep.

71. Zhao, X., Maher, S., Musleh, R., **Khire, M.**, Voice, T. and Hashsham, S. (2003), "Full-scale evaluation of bioreactor landfill technology," *Proceedings of SWANA 8th Annual Landfill Symposium*, Atlantic City, NJ, 16-20 June.

72. Zhao, X., Maher, S., **Khire, M.**, Musleh, R., Voice, T., and Hashsham, S. (2003), "Bioreactor Landfill Research and Demonstration Project at the Northern Oaks Landfill, MI," *Proceedings of the Waste Tech Landfill Conference 2003*, New Orleans, Louisiana, 16-18 Feb.

73. **Khire, M**., Kortegast, M., and Amputch, A. (1999), "Field Data and Modeling of Leachate Quantities for New Zealand Landfills," *Proceedings of WasteMINZ Conference*, Queenstown, New Zealand, Nov.

74. Kortegast, A., Amputch, A., and **Khire, M.** (1999), "Financial Modeling of New Zealand Landfills," *Proceedings of WasteMINZ Conference*, Queenstown, New Zealand, Nov.

75. **Khire, M**., Benson, C., and Bosscher, P. (1997), "Water Balance of Two Earthen Landfill Caps in a Semi-Arid Climate," *Proceedings of International Containment Technology Conference and Exhibition*, St. Petersburg, FL, Feb.

76. Williams, N., Khatami, A., **Khire, M.**, and Perera, P. (1997), "Selection Criteria and Performance Evaluation Methodology for Landfill Lining Systems," *Proceedings of Environment'97, International Conference and Trade Fair*, Cairo, Egypt, Feb.

77. Benson, C. and **Khire M.** (1995), "Earthen Materials in Surface Barriers," *National Academy of Sciences/DOE Workshop on Barrier Technology*, Denver, CO, 13 Aug.

78. **Khire, M.,** Benson, C., Bosscher, P., and Pliska R. (1994), "Field-Scale Comparison of Capillary and Resistive Landfill Covers in an Arid Climate," *Fourteenth Annual Hydrology Days Conference*, Fort Collins, CO, 195-209.

79. **Khire, M**., Benson, C., Bosscher, P., and R. Pliska (1994), "A Field-Scale Water Balance Study of Three Landfill Final Covers," *Seventeenth International Madison Waste Conference,* Madison, WI, Oct.

Patents

80. **Khire, M**. (2009), "Fluid Distribution and Collection in Landfills and Contaminated Sites," U.S. Patent 11/980,050. **(**Related to Gas Extraction from Landfills Using Permeable Blankets).

81. **Khire, M**. (2009), "Fluid Distribution and Collection in Landfills and Contaminated Sites," U.S. Patent 11/978,296. (Related to Chemical and Biological Treatment of Contaminated Water Using Reactive Permeable Blankets).

82. **Khire, M**. (2007), "Fluid Distribution and Collection in Landfills and Contaminated Sites," U.S. Patent 11/198,754. (Related to Real Time Sensing and Estimating Hydraulic and Thermal Properties of Landfills Using Instrumented Permeable Blankets).

Other Publications

83. Benson, C., **Khire, M**., and Pliska, R. (1996), "Final Covers: HELP Needs Help from the Field," *Waste Age*, March, 89-98.

Invited or Keynote Presentations

1. **Khire, M.** and Daniels, J. (2015), "Process vs. Prescription: An Update on CCP in North Carolina," En-Vision, Crustal City, VA, 13 May.

2. **Khire, M.** (2011), "Catchment-Scale Hydrology of Water Balance Covers: Preliminary Field Data and Model Results for Austin Community Landfill," Texas Commission on Environmental Quality (TCEQ), Austin, TX, 5 Nov.

3. **Khire, M.** (2011), "Region-based Design of Landfill ET Covers for Texas: A Vision," Stakeholder Meeting, Texas Commission on Environmental Quality (TCEQ), Austin, TX, 13 Dec.

4. **Khire, M.** (2011), "Current Geoenvironmental Research Projects and Collaboration Opportunities," 2nd U.S. – Japan Geoenvironmental Engineering Workshop, Kyoto, Japan, 12 Oct.

5. **Khire, M.** (2011), "Field-Scale Evaluation of Runoff for Landfills in Texas," Stakeholder Meeting, Texas Commission on Environmental Quality (TCEQ), Austin, TX, 27 July.

6. **Khire, M.** (2011), "Lysimeters vs. Actual Evapotransirative Covers," Environmental Research & Education Foundation Workshop, Indianapolis, IN, 27 April.

7. **Khire, M.** (2011), "Evapotranspirative Caps: A Vision for Michigan," *21th Annual Solid Waste Conference*, Engineering Society of Detroit, E. Lansing, MI, 11 April.

8. **Khire, M.** (2010), "Liners and Covers: Basics to Status Quo," *20th Annual Solid Waste Conference*, Engineering Society of Detroit, E. Lansing, MI, 23 Mar.

9. **Khire, M.** (2009), "Current Research on Landfill Liquids and Gas Management," *19th Annual Solid Waste Conference*, Engineering Society of Detroit, E. Lansing, MI, 17 Mar.

10. **Khire, M.** (2008), "Yard Waste: Aerobic Composting vs. Landfilling," *Michigan Representative Mark Meadows and Environmental Stakeholders Meeting*, MI, 12 Nov.

11. **Khire, M.** (2007), "Liquid Injection Systems and Hydraulics of bioreactor Landfills," *18th Annual Solid Waste Conference*, Engineering Society of Detroit, E. Lansing, MI, 24 Oct **(KEYNOTE ADDRESS).**

12. **Khire, M.** (2007), "Unsaturated Zone Hydrology: Connection to Ground Water," 44th Annual Meeting, American Institute of Professional Geologists, Traverse City, MI, 8 Oct.

13. **Khire, M.** (2007), "Update on Permeable Blankets Technology," *Waste Tech*, Landfill Technology Conference, National Solid Waste Management Association, Miami, 13 March.

14. **Khire, M.** (2006), "Liquid Injection Systems for Bioreactor Landfills," *Waste Tech 2006 Landfill Conference*, National Solid Waste Management Association Phoenix, AZ, 28 Feb.

15. **Khire, M.** (2005), "Leachate Recirculation in Bioreactor Landfills: Alternatives and Field-Scale Testing," *2005 Minnesota Air, Water and Waste Conference*, St. Paul, MN, 16 Feb.

16. **Khire, M.** (2005), "From Love Canal to Now: Job Opportunities in Solid Waste Industry," *Great Lakes Conference 2005*, Society of Women Engineers, E. Lansing, MI, 9 April.

Other Presentations

17. **Khire, M.** (2015), "Water Balance Modeling of CCR Landfills," World of Coal Ash 2015, Nashville, TN, 6 May.

18. **Khire, M.** (2012), "Geo Environmental Research at MSU – a 10 year Overview," Department of Civil & Environmental Engineering, Michigan State University, Professional Advisory Board Annual Meeting, 26 April.

19. **Khire, M.** (2007), "Future of Bioreactor Landfills for Developing Countries," Indian Institute of Technology-Mumbai, 6 Jan.

20. **Khire, M**. (2004), "Field-Scale Evaluation of Gas Emissions from an Instrumented Bioreactor Cell," Designing, Building, & Regulating Evapotranspirative (ET) Landfill Covers, RTDF Phytoremediation of Organics Action Team, Denver, CO, April.

21. **Khire, M.** (2004), "Leachate Management Strategies for Active Landfills," *SWANA Wastecon 2004,* Phoenix, AZ, 23 Sept.

22. Martell, S.B., Weissmann, G.S., Phanikumar, M.S., Hyndman, D.W., and **Khire, M.** (2004), "Geologically-based modeling of unsaturated flow through heterogeneous alluvial sediments, Lawrence Livermore National Laboratory, California," EOS Trans. AGU, 85 (17), Jt. Assem. Suppl., Abstract H21B-03, Joint Assembly of CGU, AGU, SEG, and EEGS.

23. **Khire, K.**, Amputch, A., and Kortegast, T. (2001), "Full Cost Modeling of MSW Landfills," *Ministry for the Environment Landfill Workshop*, Wellington, New Zealand.

24. **Khire, M.**, and Kortegast, T. (2000), "Design of State-of-the-Art Liner for Stage 3 of Bluegums Landfill," *Landfill Design Guidelines Workshop*, Waste Management Institute of New Zealand, Christchurch, New Zealand, May.

25. **Khire, M**., and Benson, C. (1998), "Water Balance Modeling of Capillary Barrier Landfill Caps, *SWANA Landfill Symposium*, Palm Beach Gardens, Florida, April.

26. **Khire, M**., Benson, C., Bosscher, P., and R. Pliska (1996), "Factors Affecting the Performance of Capillary Barriers in Semi-Arid and Arid Climates," *Nineteenth International Madison Waste Conference,* Madison, WI.

27. **Khire, M**., Benson, C., Bosscher, P., and R. Pliska (1994), "A Field-Scale Water Balance Study of Two Landfill Final Covers and Hydrologic Simulation Using the Model UNSAT-H," *1994 Agronomy Abstracts and Annual Meetings*, Seattle, WA.

GRADUATE STUDENTS ADVISED

Total Number of Ph.D. Students Advised/Graduated: 9/6
Total Number of Ph.D Students Currently being Advised: 1
Total Number of Masters Students with Thesis Option Graduated: 6
Total Number of Masters Students with Project Option Graduated: 4

SELECTIVE SAMPLES OF MEDIA INTERVIEWS

Prof. Khire has been interviewed by local TV and newspapers and other media sources at least ten times since he joined MSU in 2002 to get expert opinion on news events related to contamination of the environment from the landfills, ash fills, or pipelines carrying oil and gasoline, or sewage plants. Most recent samples of his media interviews are as follows.

7/31/2012
WBEZ91.5 Chicago Public Radio

This 15 minute interview focused on my role in the MSU Green Roof research team and regulatory and technological issues associated with the utilization of Green Roofs.

6/22/2011
Pressconnect.com
Sewage plant wall also collapsed in Tennessee: Two died in Gatlinburg incident

"…Khire said the metal reinforcements at the plant do not seem corroded. The strength of the corner joints may have been exceeded, he said. Khire also pointed to overfilling or loss of concrete, and insufficient reinforcement bond strength as possible causes …."

5/21/2011
Lansing State Journal
Marathon gasoline leak

"If a company doesn't know it's losing upwards of a half-million gallons of gasoline ……," said Milind V. Khire, associate professor of civil and environmental engineering at Michigan State University.

5/13/2011
WILX-TV
"Under Pressure": Keeping Michigan's natural gas pipelines safe
http://www.wilx.com/home/headlines/Under_Pressure_Keeping_Michigans_Natural_Gas_Pipelines_Safe_121753874.html

"These pipelines, some of them are carrying anywhere from 1,000 to 1,500 psi pressurized gas, which is an enormous amount of pressure……," said Milind Khire, engineering professor at Michigan State.