RICARDO MEDINA — Curriculum vitae

CONTACT INFORMATION

449 Melody Ln., Apt. #1
Placentia, CA 92870

Phone: (805) 320-9185
ricarm3@uci.edu
Personal Website

RESEARCH INTERESTS

Hydrogeology, water resources, groundwater and fracture flow, multi-phase fluid flow, geologic fracture mechanics, fluid mechanics, suspended particles flow and settling, hydrologic modeling, groundwater resource management

EDUCATION

University of California, Irvine, Irvine, CA — June 2018
Ph.D., Civil Engineering
- Thesis title: *Experimental investigation of multi-component suspensions flowing and settling in analog fractures*
- Advisor: Russell L. Detwiler, Ph.D.

California State University Los Angeles, Los Angeles, CA — June 2013
M.S., Civil Engineering
- Thesis title: *A study of a flyash amended soil and its effect on nitrate movement through unsaturated media*
- Advisor: Gustavo B. Menezes, Ph.D.

University of California, Davis, Davis, CA — June 2009
B.S., Civil Engineering
Minor, Chicano/Chicana Studies

RESEARCH EXPERIENCE

Postdoctoral Research Associate — April 2018 – present
Research and Development, Orange County Water District
Supervisor: Megan H. Plumlee, Ph.D.
- Collected and processed data from fiber optic distributed temperature sensors to evaluate the spatio-temporal evolution of infiltration rates at a groundwater recharge basin
- Analyze experimental and field data
- Collected, processed, and analyzed soil characteristics and water quality of field samples
- Made improve to experimental soil column apparatus and other field sampling procedures

Research Assistant — June 2013 – 2018
Civil and Environmental Engineering Department, UC Irvine
Supervisor: Russell L. Detwiler, Ph.D.
- Design experimental-setup & components for the analysis of suspension flow-through experiments
- Design and perform experiments of multi-component proppants settling inside transparent deformable fractures under an applied stress
- Use advanced image processing techniques to analyze experimental data
- Troubleshoot mechanical, electrical, optical, and hydraulic components of experimental setup
- Supervised various undergraduate student projects

Research Assistant Sept 2010 – June 2013

Department of Civil Engineering, California State University, Los Angeles
Supervisors: Gustavo B. Menezes, Ph.D and Arturo Pacheco-Vega, Ph.D

- Analyze effluent solutions from column experiments using ion chromatograph
- Developed guidelines for the use of a newly acquired steady state centrifuge - unsaturated flow apparatus
- Design, implement, and evaluate the impact of incorporating a combined physical and computational (CFD) experiment in an undergraduate fluid mechanics laboratory
- Supervised two undergraduate student projects

Teaching Experience

Teaching Assistant Winter 2018

Civil and Environmental Engineering Department, University of California, Irvine
Class: CEE 171 - Water Resources Engineering
Instructor: Russell L. Detwiler, Ph.D

Teaching Assistant Fall 2017

Civil and Environmental Engineering Department, University of California, Irvine
Class: CEE 172/272 - Groundwater Hydrology
Instructor: Russell L. Detwiler, Ph.D

Part Time Lecturer Spring 2017

Department of Civil Engineering, California State University, Los Angeles
Class: CE 2800 - Numerical Methods for Engineers I

Teaching Assistant Winter 2017

Civil and Environmental Engineering Dept., University of California, Irvine
Class: CEE 171 - Water Resources Engineering
Instructor: Russell L. Detwiler, Ph.D

Part Time Lecturer Summer 2015

Department of Civil Engineering, California State University, Los Angeles
Class: CE 380 - Numerical Methods II

Teaching Assistant Winter 2015

Civil and Environmental Engineering Dept., University of California, Irvine
Class: CEE 171 - Water Resources Engineering
Instructor: Russell L. Detwiler, Ph.D

Teaching Assistant Fall 2012 – Spring 2013

Department of Civil Engineering, California State University, Los Angeles
Class: CE 280 - Numerical Methods I/II
Instructor: Gustavo B. Menezes, Ph.D and Francisco J. Evangelista, Ph.D

Laboratory Assistant Winter 2011

Department of Civil Engineering, California State University, Los Angeles
Class: CE 303L - Fluid Mechanics Laboratory
Instructor: Gustavo B. Menezes, Ph.D

Journal Publications

1. **Medina, R.**, R.L. Detwiler, R. Prioul, W. Xu, and J.E. Elkhoury. Settling and mobilization of sand-fiber proppants in a deformable fracture, *Water Resour. Res.*, in press, 2018. DOI: 10.1029/2018WR023355

2. **Medina, R.**, R.L. Detwiler, R. Prioul, W. Xu, and J.E. Elkhoury. Effect of flow geometry on the evolution of concentrated suspensions flowing through a fracture, *International Journal of Multiphase Flow*, Vol 108, pp 80-92, 2018. DOI: 10.1016/j.ijmultiphaseflow.2018.06.014

3. **Medina, R.**, J.E. Elkhoury, J.P. Morris, R. Prioul, J. Desroches, and R.L. Detwiler. Flow of concentrated suspensions through fractures: small variations in solid concentration cause significant in-plane velocity variations *Geofluids*, Vol 15 (1-2) pp 24-36, 2015. DOI: 10.1111/gfl.12109

4. **Medina, R.**, Menezes, G.B., Ellis, A., and Khachikian, C.S. Use of Flyash as Soil Amendment to Offset Anion Exclusion Effect on Nitrate Transport. *Vadose Zone Journal*, Vol 14 (4), 2015. DOI: 10.2136/vzj2014.08.0103

Book Chapters

1. **Medina, R.**, J.E. Elkhoury, J.P. Morris, R. Prioul, J. Desroches, and R.L. Detwiler. Flow of concentrated suspensions through fractures: small variations in solid concentration cause significant inplane velocity variations *Crustal Permeability*, T. Gleeson & S. Ingebritsen (Editors), Wiley. 2016. DOI: 10.1002/9781119166573

Conference Publications & Presentations *

1. **Medina, R.**, R.L. Detwiler, R. Prioul, W. Xu, and J.A. Ortega (2016). Fiber-ladden proppant placement in a deformable fracture: influence of fracture-surface roughness. Poster presented at the annual American Geophysical Union (AGU) meeting, San Francisco, CA.

2. **Medina, R.**, R.L, Detwiler, R. Prioul, and J.A. Ortega (2016). Effect of confining stress on sand-fiber proppant placement in a deformable fracture. Paper presented at the American Rock Mechanics Association (ARMA), 50th annual U.S. Rock Mechanics Geomechanics Symposium, Houston, TX

3. **Medina, R.**, R.L. Detwiler, R. Prioul, W. Xu, and J.A. Ortega (2015). Proppant distribution in a fracture subjected to normal stress: Formation of sand-fiber islands capable of supporting an applied load. Poster presented at the annual American Geophysical Union (AGU) meeting, San Francisco, CA.

4. **Medina, R.**, R.L, Detwiler, J.P. Morris, R. Prioul, J. Desroches, and J.A. Ortega (2015). Flow of high solid volume fraction fluids through fractures and around obstructions. Paper presented at the American Rock Mechanics Association (ARMA), 49th annual U.S. Rock Mechanics Geomechanics Symposium, San Francisco, CA

5. **Medina, R.**, J.E. Elkhoury, J.P. Morris, R. Prioul, J. Desroches, and R.L. Detwiler (2014). Flow of dense suspensions through fractures: Significant in-plane velocity variations caused by small variations in solid concentration. Presented at the annual American Geophysical Union (AGU) meeting, San Francisco, CA.

6. **Medina, R.**, J.E. Elkhoury, J.P. Morris, R. Prioul, J. Desroches, and R.L. Detwiler (2014). Flow of dense suspensions through fractures: Experimental and computational observation of velocity-field heterogeneity. Paper presented at the American Rock Mechanics Association (ARMA), 48th annual U.S. Rock Mechanics Geomechanics Symposium, Minneapolis, MN

7. **Medina, R.** and Menezes, G. (2014). Nitrate Transport in Unsaturated Soil Treated with Fly Ash. Presented at the 2014 ISEG-KoSSEG International Conference on Soil and Groundwater Environment, Seoul, Korea.

8. **Medina, R.**, J.E. Elkhoury, J.P. Morris, R. Prioul, J. Desroches, and R.L. Detwiler (2013). Flow and geometry control the onset of jamming with high-solid-fraction fluids. Poster presented at the annual American Geophysical Union (AGU) meeting, San Francisco, CA.

9. Wong K, Y., **Medina, R.**, and Menezes, G. (2013). Transport of fertilizer-derived nitrate through unsaturated low conductivity soil. Poster presented at 2013 Groundwater Resources Association (GRA) Managing Aquifer Recharge Symposium, Burlingame, CA.

10. Wong K, Y., **Medina, R.**, and Menezes, G. (2013). Transport of fertilizer-derived nitrate through unsaturated low conductivity soil. Oral presentation at 2013 National Groundwater Association (NGWA) Summit: The National and International Conference on Groundwater, San Antonio, TX.

11. **Medina, R.**, Wong K, Y., and Menezes, G. (2012). Transport of fertilizer-derived chemicals through unsaturated soils near coastal areas. Poster presented at California State University Los Angeles, Research and Senior Design Exposition, Los Angeles, CA.

12. **Medina, R.**, Wong K, Y., and Menezes, G. (2012). Transport of Fertilizer-Derived Chemicals Through Unsaturated Media, in: Proceedings of the XII International Symposium on Environmental Geotechnology, Energy and Global Sustainable Development: Vol. III - Water Sustainability. June, 2012. Los Angeles, CA, USA. pp, 299-309

13. **Medina, R.**, Motamedi, A., Okcay, M., Oztekin, U., Menezes, G., and Pacheco-Vega, A. (2012). On the Implementation of Open Source CFD System to Flow Visualization in Fluid Mechanics. Paper presented at the 2012 American Society for Engineering Education (ASEE), National Conference, San Antonio, TX, Paper No. AC 2012-5482.

14. **Medina, R.**, Okcay, M., Menezes, G., and Pacheco-Vega, A (2011). Implementation of Particle Image Velocimetry in the Fluid Mechanics Laboratory. Paper presented at the 2011 Pacific South West American Society for Engineering Education (ASEE) Conference, Fresno, CA, USA, pp. 42-50.
**Note: Name of presenting co-author is underlined.*

Theses & Other Reports

1. **Medina, R.** (2018) Experimental investigation of multi-component suspensions flowing and settling in analog fractures. Ph.D Dissertation, Civil and Environmental Engineering Department. University of California Irvine, CA

2. **Medina, R.** (2013) A study of a flyash amended soil and its effect on nitrate movement through unsaturated media. M.S. Thesis, Dept. of Civil Engineering. California State University, Los Angeles, Los Angeles, CA.

Publications in Preparation

1. Pham, C., **Medina, R.**, Plumlee, M.H., "Effect of water-quality on the percolation rate of soil columns."

2. **Medina, R.**, Plumlee, M.H., Pham, C. "Spatial variability of percolation rates at a managed aquifer recharge (MAR) spreading basin."

3. **Medina, R.**, Plumlee, M.H., Pham, C. "Effect of cleaning strategies on percolation rates at a recharge basin."

4. **Medina, R.**, Plumlee, M.H., Pham, C. "Spatial variability of percolation rates at a managed aquifer recharge (MAR) spreading basin."

5. **Medina, R.**, "Estimating transmissivity and storativity of a multi-layer aquifer using pump-test data and data assimilation techniques"

Other Presentations

1. 'The road to grad school: How to navigate the graduate school application process', Presented to the Society of Hispanic Professional Engineers, California Polytechnic University Pomona chapter. – May 2017
2. 'The Value of a SHPE Graduate Leader', Presented at the Society of Hispanic Professional Engineers Region 2 Regional Leadership Development Conference, Tempe, AZ. – April 2016
3. Invited guest speaker to the Center for Energy & Sustainability (CE&S) Seminar Series: "The anomalies of suspended solid flows though a fracture: An experimental observation of solid transport velocities" – May 2014

Awards

Scholarships, Fellowships, and Other Recognition

- Civil & Eng. Dept. Fellowship — June 2017
- Henry Samueli Endowed Fellowship — April 2017
- Honorable Mention - Ford Foundation Dissertation Fellowship — April 2016
- Civil & Eng. Dept. Fellowship — June 2016
- Civil Eng. Graduate Student of the Year - Eng. Student Council — Feb 2016
- Honorable Mention - Ford Foundation Fellowship — April 2015
- Center for Energy & Sustainability Scholarship — April 2013
- Calif. State Univ. Los Angeles Honors Convocation — April 2013
- Center for Energy & Sustainability Fellowship — Sept 2010
- Great Minds in Stem! HEENAC Scholarship — Oct 2010
- UC Davis Dean's Honors List — March 2009

Travel Awards

- NSF ASSIST Travel Grant to attend the Faculty Development Institute at the SHPE National Conference — Nov 2017
- NSF ASSIST Travel Grant to attend the Early Faculty Development Symposium at the HEENAC Conference — Aug 2016
- UC Irvine Department of Civil and Environmental Engineering — June 2015
- UC Irvine Department of Civil and Environmental Engineering — July 2014
- UC Irvine Associated Graduate Students — Oct 2013

Service

Graduate School Panelist — July 2015 – June 2017

SHPE, GEM Workshop, UCI's Office of Access & Inclusion, and others

- Participated in panel to advocate for the enrollment of underrepresented minorities in STEM graduate school
- Encourage undergraduate and high-school students to pursue advanced degrees
- Discussed the roadblocks and available resources to apply and be successful in graduate school

Regional Graduate Representative — July 2015 – June 2017

Society of Hispanic Professional Engineers

- Developed workshops/presentations for incoming graduate students
- Coordinate and develop workshops on *'Graduate Entry Success'* aimed at underrepresented students in STEM fields.
- Curriculum committee vice-chair: in charge of developing, coordinating, and managing workshops for the *Graduate Track* at the Regional Leadership Development Conference
- Volunteered at the 'Noche de Ciencias' (Night of science) event hosted at Century High School in Santa Ana, CA

- Mentored undergraduate students majoring in Civil Engineering through the MentorSHPE program

Recruiting committee volunteer April 2014
Department of Civil & Environmental Engineering
- Assist with and coordinate lab-tours during the College of Engineering Open House and Admitted Student Visit Days
- Met with prospective graduate students to help them familiarize with the research facilities, academic culture, and the UCI community

Volunteer/Mentor 2007
Movimiento Estudiantil Chicano de Aztlán (MEChA) of UC Davis
- Tutored and mentored underrepresented minority students at Douglas Middle School.

Relevant Work Experience

Graduate Student Assistant Apr. 2010 - Aug. 2012
California Regional Water Quality Control Board – Los Angeles Basin Region
- Review quarterly/biannual groundwater and soil contamination data reports for leaking underground storage tanks
- Determine extent of contaminant spreading and evaluate cleanup efforts
- Determine if site meets CA EPA standards for contaminated groundwater and soil remediation; upon assessment make a recommendation to close case or continue monitoring the contaminated site
- Maintain and update case files using the state's data management tool, GeoTracker
- Served as the Freedom of Information Act (FOIA) officer/point of contact for the Underground Storage Tanks unit

Mentor/Tutor June 2006 – Aug. 2006
UC Santa Barbara – Oxnard Union High School District: Summer Algebra Academy
- Mentor incoming high school freshmen
- Taught class/lesson on several occasions
- Advised students on high school pathways towards a college education
- Translate for Spanish-speaking parents during student-parent conference night
- Met with regional coordinator to implement best practices and lessons learned for future cohorts

Software Skills

- MATLAB, OpenFOAM, LaTeX, LabView, Adobe Illustrator, UNIX shell scripting, GNU Octave, Mathematica, MS Office suite, Libre Office, GIS (intermediate), AutoCAD (beginner), EPANET, SWWM (EPA), and others

Professional Affiliations

Society of Petroleum Engineers (SPE)	Student member 2016
American Rock Mechanics Association (ARMA)	Student member 2013
American Geophysical Union (AGU)	Student member 2013
American Society of Engineering Education (ASEE)	Student member 2011
Society of Hispanic Professional Engineers (SHPE)	Student member 2005

Professional References

Megan H. Plumlee, Ph.D., P.E.
Director of Research
Department of Research & Development
Orange County Water District

Phone: (714) 378-3270
E-mail: mplumlee@ocwd.com

Russell L. Detwiler, Ph.D.
Associate Professor
Department of Civil and Environmental Engineering
University of California, Irvine
Phone: (949) 824-7152
E-mail: detwiler@uci.edu

Romain Prioul, , Ph.D.
Program Manager Evergreen Geomechanics & Scientific Advisor
Reservoir Geosciences Department
Schlumberger-Doll Research
Phone: (617) 768 - 2299
E-mail: rprioul@slb.com

Gustavo B. Menezes, Ph.D.
Associate Professor
Department of Civil Engineering
California State University, Los Angeles
Phone: (323) 343-4578
E-mail: gmeneze@calstatela.edu

Jean E. Elkhoury, Ph.D.
Senior Research Scientist
Schlumberger-Doll Research
Phone: (617) 768 - 2000
E-mail: elkhoury@ucla.com