

Curriculum Vitae

Eric A. Marchand
Assistant Professor of Environmental Engineering
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Education

2000	Ph.D. – Civil Engineering	University of Colorado at Boulder Advisor: Professor JoAnn Silverstein
1996	Master of Science – Civil Engineering	University of Nevada, Reno Advisor: Professor E. Joe Middlebrooks
1994	Bachelor of Science – Civil Engineering	University of Nevada, Reno

Professional Experience

2000 – Pres.	Assistant Professor; Department of Civil and Environmental Engineering; University of Nevada, Reno
1999 – 2000	Environmental Engineering Laboratory Manager; Department of Civil, Environmental, and Architectural Engineering; University of Colorado at Boulder
1996 – 2000	Research/Teaching Assistant; Department of Civil, Environmental, and Architectural Engineering; University of Colorado at Boulder
1995 – 1996	Research/Teaching Assistant; Department of Civil Engineering; University of Nevada, Reno
1994	Solid Waste Engineering Intern; Lifetouch Portrait Studio; Reno, NV
1993	Engineering Intern (General Construction); Sierra Pacific Power Co.; Reno, NV

Awards and Honors

1993	Received Department of Civil Engineering Junior of the Year Award at UNR
1994	Received Department of Civil Engineering Senior of the Year Award at UNR
1994	Best Paper in the ASCE Student Paper Competition
1994	Awarded Herz Gold Medal for top graduating senior at UNR
1994	President of the Student Chapter of AWWA/WEF at UNR for 1994-95 academic year
1995	Received U.S. EPA Science to Achieve Results (STAR) fellowship for M.S. degree studies

- 1996 Received U.S. EPA Science to Achieve Results (STAR) fellowship for Ph.D. degree studies
2002 Junior Faculty Research Award at UNR
2003 Received NSF CAREER Award

Courses Taught at UNR

- Engineering Hydrology (CEE 364; Junior Level; 3 Credits; Fall 2001-04)
- Environmental Microbiology (CEE 453/653; Senior/Graduate Level; 3 Credits; Fall 2000-04)
- Biological Unit Operations (CEE 751; Graduate Level; 4 Credits; Spring 2001-04)
- Industrial Waste Treatment (CEE 755; Graduate Level; 2 Credits; Spring 2001, 2003)
- Bioremediation (CEE 495/771; Senior/Graduate Level; 3 Credits; Spring 2002, 2004)
- Environmental Chemistry (CEE 756; Graduate Level; 3 Credits; Spring 2005)
- Engineering Seminar (CEE 360/750; Undergraduate/Graduate level; 1 Credit; Spring 2005-Present)

Professional Membership

- American Water Works Association (AWWA)
- American Society of Civil Engineers (ASCE)
- Water Environment Federation (WEF)
- Association of Environmental Engineering and Science Professors (AEESP)
- American Society of Engineering Education (ASEE)
- Golden Key National Honor Society
- Tau Beta Pi Engineering Honor Society
- Registered Engineer-in-Training (EIT) by the Nevada Board (#2724)

Research Interests

- Biogeochemistry of acid mine drainage and application of bioremediation principles to prevent acid formation
- Biological reduction of perchlorate-contaminated wastewater
- Nutrient removal and metal dynamics in wetland systems
- Fate of contaminants in environmental systems.

Research Grants as PI

- \$31K “Faculty Start-up Enhancement Grant”
NSF EPSCoR (7/01 – 6/02)
- \$13K “Development of a 2-Phase Hydrogen Gas Bioreactor for Treatment of Wastewater in Space”
Nevada Space Grant Consortium (8/01 – 12/02)
- \$25K “An Interdisciplinary Investigation into the Factors Affecting Membrane Biofouling”
NSF EPSCoR Interdisciplinary Studies of Environmental Science Program (11/01 – 8/02)
- \$15K “An Investigation of the Factors Affecting Biological Treatment of Perchlorate”
UNR Junior Faculty Research Grant (JFRG) Program (7/02 – 12/03)

- \$13K “The Use of AFM to Better Understand Factors Affecting Membrane Biofouling”
Nevada Ventures Nanoscience Program (NVNP) (7/02 – 6/03)
- \$400K “CAREER: Microbial-Based Engineering Approaches for Prevention and Treatment of Acid Mine Drainage – An Integrated Research and Teaching Plan”
National Science Foundation (NSF) (7/03 – 6/08)
- \$47K “Monitoring the Concentration of PAHs in Runoff from Seal-Coated Surfaces”
Pavement Coating and Technology Center (PCTC) (10/04 – 12/05)

Research Grants as co-PI

- \$265K “Anaerobic Digestion at Low Temperatures”
NASA-EPSCoR (10/01 – 9/04)
- \$115K “Should Constructed Wetlands be Incorporated into Proposed Flood Control Projects for the Truckee River?”
U.S. Environmental Protection Agency (7/02 – 12/03)
- \$48K “Development of a Model to Predict the Treatment Efficiency of a Full-Scale Constructed Wetland System at the Confluence of the Truckee River and Steamboat Creek”
Nevada Department of Environmental Protection (5/03 – 12/04)
- \$108K “Source Water Characterization of Washoe County Wells”
Washoe County Water Resources Division (9/03 – 8/04)
- \$30K “Optimization of Filter Operation at South Truckee Meadows Water Treatment Plant”
Washoe County Water Resources Division (7/03 – 3/04)
- \$69K “The Use of Membranes to Reduce Dissolved Solids Loading to the Truckee River”
Cities of Reno and Sparks (7/02 – 6/03)
- \$365K “Reduction of Nutrient Loadings and Impacts of Mercury Contamination from Nonpoint Source Pollution through Wetland Management, Steamboat Creek Watershed, Nevada”
USDA, Cooperative State Research, Education, and Extension Service (9/03 – 8/06)
- \$162K “Astrobiology Research Group: Anaerobic Digestion at Low Temperatures”
NASA EPSCoR (10/04 – 9/06)
- \$58K “Evaluation and Enhancement of Sediment Retention and Trapping Devices”
Nevada Division of State Lands (4/05 – 1/07)
- \$100K “Enhanced Pattern Recognition of Target Chemicals and Detection of Bacteria Species with a Compact Vapor Detection System”
Department of Energy (9/05 – 3/07)
- \$974K “Innovative Treatment Technologies for Natural Waters and Wastewaters at the University of Nevada, Reno”
Department of Energy (Pending 2-year project)

Funded Teaching Grants

- \$12K UNR Computing Enhancement Program (2001) – A proposal was funded to enhance the computer capabilities in the CEE Department. The computer system included a LCD projector and computer cart with a VCR. In addition, internet drops were installed in all teaching classrooms in SEM not designated as “smart classrooms” (a total of 4 rooms).
- \$1.5K Teaching Based Software Acquisition (2001) – A proposal was submitted to the UNR Faculty Senate Technology Committee obtain software to enhance teaching of CEE classes.
- \$12K UNR Computing Enhancement Program (2002) A proposal was submitted to enhance the computer capabilities in the Department of Civil Engineering. The computer system included a LCD projector and computer cart with a VCR.
- \$112K Multi-threaded Instruction: Forming Multi-disciplinary Research Groups to Improve Undergraduate Education
National Science Foundation (1/02 – 12/04)

Peer-Reviewed Journal Publications

- Park, C. and E.A. Marchand (2005) Microbial Anaerobic Respiration with Perchlorate and Trichloroethylene, Submitted to Water Research, Status: In review.
- Chavan, P.V., M.S. Gustin, K.E. Dennett, E.A. Marchand, and S. Donaldson (2005) Evaluation of Methyl Mercury Production as a Function of Environmental Conditions in Constructed Wetland Mesocosms, Submitted to Journal of Environmental Quality, Status: In review.
- Park, C. and E.A. Marchand (2005) The Influence of High Salinity on Perchlorate Reduction, Submitted to The Journal of Applied Microbiology, Status: In review.
- Gormly, S., V.D. Adams, E.A. Marchand (2003) Physical Simulation for Low-Energy Astrobiology Environmental Scenarios, *Astrobiol.*, 3(4):761-770.
- Whisman, N., D. York, L. Manning, J. Brant, R. Dyer, A. Childress, E.A. Marchand, and J.D. Adams (2003) Probing Microplatform for the Study of Biological Adhesion Forces, *Rev. Sci. Instrum.*, 74(10):4491-4494.
- Marchand, E.A. and J. Silverstein (2003) The Role of Enhanced Heterotrophic Bacterial Growth on Iron Oxidation by *Acidithiobacillus ferrooxidans*. *Geomicrobiol. J.*, 20(3):231-244.
- Marchand, E.A. and J. Silverstein (2002) Influence of Heterotrophic Microbial Growth on Biological Oxidation of Pyrite, *Environ. Sci. Technol.*, 36:5483-5490.
- Hernandez M., E.A. Marchand, D.J. Roberts, and J. Peccia (2002) In-Situ Assessment of Active Thiobacillus Species in Corroding Concrete Sewers using Fluorescent RNA Probes. *Int. Biodeter. Biodegrad.*, 49:271-276.
- Peccia, J.L., E.A. Marchand, J. Silverstein, and M.T. Hernandez (2000) Development and Application of Small-Subunit rRNA Probes for Assessment of Selected *Thiobacillus* Species and Members of the Genus *Acidiphilium*, *Appl. Environ. Microbiol.*, 66:3065-3072.

Literature Review Articles Published in a Journal

Marchand, E.A. (2002) Minerals and Mine Drainage, *Wat. Environ. Res.*, 74(5) 27 pp (CD ROM #CD0240).

Marchand, E.A. (2003) Minerals and Mine Drainage, *Wat. Environ. Res.*, 75(6) 37 pp (CD ROM #CD0340)

Marchand, E.A. and P. Plumb (2004) Minerals and Mine Drainage, *Wat. Environ. Res.*, 76(6) 1684-1770 (CD ROM #CD0440)

Marchand, E.A. and P. Plumb (2005) Minerals and Mine Drainage, *Wat. Environ. Res.*, 77(6) 1858-1927 (CD ROM #CD0540)

Other Publications

Marchand, E.A., T. Ahmed, D. Arino, and M. Azad (1995) Disposal of Sewage Sludge in a Monofill, Guidance Document prepared for the Nevada Department of Environmental Protection (NDEP).

Marchand, E.A. (1996) Evaluation of Ion Exchange for Removal of the Bromide Ion from Drinking Water. M.S. Thesis, University of Nevada, Reno, USA.

Marchand, E.A. (2000) The Role of Induced Heterotrophic Microbial Growth in Mitigating the Effects of Acid Mine Drainage. Ph.D. Dissertation, University of Colorado at Boulder, USA.

Invited Presentations

Marchand, E.A. (2000) Acid Mine Drainage Treatment Alternatives, Presented to the Department of Chemical Engineering at the University of Nevada, Reno, September 8, 2000.

Marchand, E.A. (2002) Environmental Microbiology and Bioremediation Technology, Presented to the Truckee Meadows Branch of ASCE, June 18, 2002.

Marchand, E.A. (2003) The Role of Induced Heterotrophic Microbial Growth in Mitigating the Effects of Acid Mine Drainage, Presented to the Department of Civil and Environmental Engineering at UC Davis, November 24, 2003.

Marchand, E.A., K.E. Dennett, and K. Navenathan (2004) Monitoring the Concentration of PAHs in Runoff from Seal-Coated Surfaces, Presented to members of the Pavement Coating and Technology Center, June 13, 2005.

Marchand, E.A. (2005) The Role of Enhanced Heterotrophic Growth on Microbial Pyrite Oxidation, To be presented at the 2005 Society of Environmental Toxicology and Chemistry (SETAC) North America 26th Annual Meeting to be held November 13-17, 2005.

Conference Publications and Presentations

- Park, C. and E.A. Marchand (2005) Biodegradation of Perchlorate and Trichloroethylene Under Anaerobic Conditions, Oral presentation and paper published in proceedings at the In Situ and On-Site Bioremediation Symposium, Baltimore, MD, June 6-10.
- Plumb, P. and E.A. Marchand (2005) Control of Acid Mine Drainage by Inducing Heterotrophic Bacterial Growth, Oral presentation and paper published in proceedings at the In Situ and On-Site Bioremediation Symposium, Baltimore, MD, June 6-10.
- Chavan, P., M.S. Gustin, and E.A. Marchand, and K.E. Dennett (2005) The Influence of Wetlands on Mercury Methylation, Oral presentation and paper published in proceedings at the In Situ and On-Site Bioremediation Symposium, Baltimore, MD, June 6-10.
- Gustin, M.S., R. Chavan, J. Stamenkovic, J. Ericksen, S. Brown, L. Saito, K. Dennett, E. Marchand, and S. Donaldson (2005) The Potential for Methyl Mercury Production in Constructed Wetlands and a Riparian Setting, Oral presentation and abstract delivered at the 15th Annual Goldschmidt Conference, May 2005, Moscow, ID.
- Chavan, P.V., M.S. Gustin, K.E. Dennett, and E.A. Marchand (2005) Assessment of Methyl Mercury Production and Water Quality Parameters in Constructed Wetlands, Oral presentation at the annual conference of American Geological Society, February 2005, San Diego, CA.
- Gormly, S., V.D. Adams, and E.A. Marchand (2004) Environmental Engineering Methods for European Relevant Biosignature Development, Presented and published in proceedings for the 34th International Conference on Environmental Systems, publication #04ICES-2, Colorado Springs, CO.
- Gormly, S., V.D. Adams, and E. Marchand (2004) Development of an Extremophile Microbial Digester for Astrobiology Relevant Biomass Production, Presented and published at the Astrobiology Science Conference, March, 2004, NASA-Ames, Moffett Field, CA..
- Gupta, A.K., K.E. Dennett, and E.A. Marchand (2003) Optimization of Coagulant Dosing for the Removal of Solids in Filter Backwash Water at TMWRF, Presented at the 2003 Nevada Water Environment Association (NWEA) Annual Meeting, Las Vegas, NV.
- Park, C. and Marchand, E.A. (2002) Biological Perchlorate Reduction of High-Salinity Wastewaters, Presented and published at the 3rd International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA, May 20-23.
- Adams, J.D., A.E. Childress, and E.A. Marchand (2001) Nanotechnology in Teaching and Research at the University of Nevada, Reno, Presented at Nevada Ventures Meeting, November 2001, Reno, NV.
- Marchand, E.A. and J. Silverstein (2001) Minimization of Acid Mine Drainage by Stimulating Beneficial Microbial Growth, Presented at the 68th Annual Conference of the Pacific Northwest Pollution Control Association; Bend, OR, October 28-31.
- Marchand, E.A. and J. Silverstein (2000) Remediation of Acid Rock Drainage by Inducing Biological Iron Reduction, Presented and published at the Fifth International Conference on Acid Rock Drainage (ICARD), Denver, CO, May 21-24, 1201-1207.

Marchand, E.A. and J. Silverstein (1999) Remediation of AMD Sites by Inducing Iron Respiration, Presented at the 1999 International Symposium for Subsurface Microbiology (ISSM) Conference, Vail, CO, August 22-27.

Marchand, E.A. and J. Silverstein (1999) Biological Control of Acid Mine Drainage, Abstract and poster presented at the 1999 Science to Achieve Results (STAR) Conference, Arlington, VA, July 17-20.

Marchand, E.A. and J. Silverstein (1998) Biological Control of Acid Rock Drainage, Abstract and Poster presented at the 1998 Science to Achieve Results (STAR) Conference, Arlington, VA, June 14-16.

Brewer, T.F., J.G. Curtis, E.A. Marchand, V.D. Adams, and E.J. Middlebrooks (1994) Sensitized Photooxidation of Sulfide-Laden Water, Presented and published at the International Petroleum Environmental Conference: Environmental Issues and Solutions in Petroleum Exploration, Production, and Refining, Houston, TX, March 2-4.

Brewer, T.F., J.G. Curtis, E.A. Marchand, V.D. Adams, and E.J. Middlebrooks (1994) Sensitized Photooxidation of Dissolved Sulfides in Water, Presented and published at the 1994 National Conference on Environmental Engineering: Critical Issues in Water and Wastewater Treatment, Boulder, CO, July 11-13.

Thesis Advisor and Graduate Supervision

- Bailey Cannon, M.S. Candidate, Environmental Engineering Program, UNR – Undergraduate Researcher (2003) and M.S. Student (Co-advisee, 2005 – Present)
- Rob Dyer, M.S. Candidate, Environmental Engineering Program, UNR (2001 – Present, Inactive)
- Kandasamy Naventhan, M.S. Candidate, Environmental Engineering Program, UNR (2004 – Present)
- Chris Ore, M.S. Candidate, Environmental Engineering Program, UNR (2004 – Present)
- Chan-Jae Park, Ph.D. Candidate, Environmental Engineering Program, UNR (2001 – Present)
- Patrick Plumb, Ph.D. Candidate, Environmental Engineering Program, UNR (2003 – Present)
- Nichole Whisman, M.S. Graduate, Mechanical Engineering, UNR (Co-advisee, 2002 – 2004)

Undergraduate Researcher Supervision

- Bailey Cannon, B.S. Student, Environmental Engineering Program (2003)
- David Levine, B.S. Student, Environmental Engineering Program (2004 – Present)
- Johanna Kerr, B.S. Student, Environmental Engineering Program (2003 – 2004)
- Derek Ridenoure, B.S. Student, Civil Engineering Program (2005)
- Nicole Whisman, B.S. Student, Mechanical Engineering (2001)

Activity Directed toward Improving Teaching

- Graduate Teacher Program (GTP) at CU-Boulder (1999 – 2000)
- Making the First Day a Success; University of Nevada, Reno; August 24, 2000
- WebCT as an Instructional Tool Workshop, University of Nevada, Reno; September 29, 2000
- Teaching Portfolio Workshop; University of Nevada, Reno; October 4 and 25, 2000

- 6th Annual Conference for the Science and Engineering Education Scholars Program; University of Minnesota; July 30 – August 2, 2001
- Participated in the NSF-Sponsored SUCCEED meeting held at UNR for enhanced undergraduate teaching; March 11, 2002
- Best Practices in Graduate Education; University of Nevada, Reno; November 7, 2003

Professional and Outreach Activity

- NSF Panel Proposal Reviewer
 - Bioengineering & Environmental Systems (BES) – July 2002, May 2003, December 2003
 - Coupled Biogeochemical Cycles (CBC) Initiative – February 2003, February 2005
- Manuscript Reviewer
 - ASCE Journal of Environmental Engineering
 - Bioremediation Journal
 - FEMS Microbiological Ecology
 - Journal of Applied Microbiology
 - US Geological Survey
- Served as external reviewer for tenure and promotion committee at Worcester Polytechnic Institute (WPI) (2005)
- Member of Literature Review Committee for Water Environment Federation – Minerals and Mine Drainage Section (2001 – Present)
- Reuse Nevada Committee Member; Nevada Water Environment Association (NWEA) (2002 – Present)
- Technical advisor for the Tahoe-Baikal Institute (TBI) Summer Program (2001 – 2003)
- Faculty advisor for the student chapter of AWWA/WEF at UNR (2001 – 2003)
- Judge for Nevada Regional Science Fair (2001 – 2005)
- Organized and directed the week-long UNR Environmental Engineering Explorations Summer Camp (2005)
- Faculty Coordinator for Engineering Day exhibits (Environmental Engineering) at UNR (2001 – Present)