ROBERT NERENBERG, Ph.D., P.E.

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1. HIGHER EDUCATION

2003 Ph.D. in Environmental Engineering, Northwestern University, Evanston
1992 M.S. in Civil Engineering, Wayne State University, Detroit
1990 B.S. in Civil Engineering, University of Buenos Aires, Argentina

2. CURRENT AND PREVIOUS POSITIONS

2011- 2012	Visiting Professor, Dept. of Hydraulics and Environmental Engineering, Pontifical Catholic University of Chile
2011	Visiting Professor, Swiss Federal Institute for Aquatic Science and Technology (EAWAG), Dübendorf, Switzerland (5/2011 – 6/2011)
2010 – present	Director of Graduate Studies, Department of Civil Engineering and Geological Sciences, University of Notre Dame
2010 - present	Associate Professor, University of Notre Dame
2004-2010	Assistant Professor, University of Notre Dame
2007-present	Member of Energy Center, University of Notre Dame
2004-2009	Member of Environmental Molecular Science Institute, University of Notre Dame
6/2003-12/2003	Post-Doctoral Research Fellow, Northwestern University (6 months)
1998-2003	Research Assistant, Northwestern University
1992-1997	Environmental Engineer, Harza Engineering Company (now MWH, Inc.), Chicago, IL
1990-1992	Assistant Engineer, Ayres, Lewis, Norris & May, Inc., Ann Arbor, MI
1990	Engineering Assistant, City of Ann Arbor Wastewater Treatment Plant, Ann Arbor, MI

3. SCHOLARSHIPS AND FELLOWSHIPS

- Visiting professor fellowship, Pontifical Catholic University of Chile
- Scholarship for "E.C.–U.S. Molecular Biology for the Environment." Competitively selected by U.S. Biotechnology Task Force for 2-week course in Madrid. Sponsored by DOE and the European Union, 2003
- Abel Wolman Doctoral Fellowship, American Water Works Association, 2001-2003 ($60,000)
- Graduate Student Scholarship, ASCE, IL Chapter, 2001 ($2,000)
- Murphy Fellowship, Northwestern University, 1997

4. DISTINCTIONS AND AWARDS

- Paul Busch Award, 2012
- NSF CAREER Award, 2010

- Paper selected as "spotlight article" featured in December 15, 2008 issue of Biotechnology and Bioengineering (Biotechnology and Bioengineering 101:6:1193-1204)
- Metcalf & Eddy Academic Design Competition, 2005/2006, First Place (Academic Advisor) ($5,500 cash prize for students, department, and advisor; expense-paid trip to NYC for students and advisor)
- Metcalf & Eddy Academic Design Competition, 2004/2005, Second Place (Academic Advisor) ($1,000 cash prize for students)
- Battelle Student Paper Award, Battelle Bioremediation Symposium, Orlando, 2003
- Research Poster Award, Northwestern University Materials Research Science and Engineering Center, 2003

5. PROFESSIONAL MEMBERSHIPS

- American Society for Civil Engineers (ASCE)
- American Society for Microbiology (ASM)
- Association of Environmental Engineering and Science Professors (AEESP)
- International Water Association (IWA)
- Water Environment Federation (WEF)

6. TECHNICAL PUBLICATIONS AND PRESENTATIONS

Refereed Publications

*Advised graduate student, **Advised undergraduate student

1. K. Martin*, **Nerenberg, R.** (2012). The Membrane Biofilm Reactor (MBfR) for Water and Wastewater Treatment: Principles, Applications, and Recent Developments. *Bioresource Technology*. DOI: 10.1016/j.biortech.2012.02.110
2. Shrout, J.D. and **R. Nerenberg** (2012) Monitoring Bacterial Twitter: Does Quorum Sensing Determine the Behavior of Water and Wastewater Treatment Biofilms? *Environ. Sci. Technol.* 46(4) 1995-2005. DOI: 10.1021/es203933h
3. Brenda Read*, Jennifer Tank, and **Robert Nerenberg** (2011). Stimulating In-Stream Denitrification with Elemental Sulfur. *Ecological Engineering*. 37:4:580-588. DOI: 10.1016/j.ecoleng.2010.12.007
4. Caitlyn Shea*, Peter Clauwaert, Stefan Green, Willy Verstraete, and **Robert Nerenberg** (2010. Bioelectrochemical Perchlorate Reduction in a Microbial Fuel Cell. *Environmental Science & Technology*. 44:12:4685-4691. DOI: 10.1021/es901758z.
5. Caitlyn Shea* and **Robert Nerenberg** (2010). Performance and Microbial Ecology of Air-Cathode Microbial Fuel Cells with Layered Electrode Assemblies. *Applied Microbiology and Biotechnology* 86:5: 1399-1408. DOI: 10.1007/s00253-009-2421-x
6. Leon S. Downing*, Kyle J. Bibby**, Kathleen Esposito, Tom Fascianella, Ryujiro Tsuchihashi, and **Robert Nerenberg** (2010). Nitrogen Removal from Wastewater using the Hybrid Membrane-Biofilm Process (HMBP): Pilot Scale Studies. *Water Environment Research* 82:3: 195-201. DOI: 10.2175/106143009X426103
7. Peter Clauwaert, Joachim Desloover, Caitlyn Shea*, **Robert Nerenberg**, Nico Boon, and Willy Verstraete (2009). Enhanced Nitrogen Removal in Bio-Electrochemical Systems by pH Control *Biotechnology Letters* 31:10:1537-1543. DOI 10.1007/s10529-009-0048-8
8. Bhoopesh Mishra, Maxim Boyanov, Shelly D. Kelly, Kenneth M. Kemner, Bruce A. Bunker, Brenda L. Read*, **Robert Nerenberg**, and Jeremy B. Fein (2009). X-ray Absorption Spectroscopy Study of Cd Adsorption onto Bacterial Consortia. *Geochimica et Cosmochimica Acta* 73:15:4311-4325. DOI: 10.1016/j.gca.2008.11.032.

9. Kelly Martin*, Leon Downing* and **Robert Nerenberg** (2009). Evidence of Specialized Bromate-Reducing Bacteria in a Hollow Fiber Membrane Biofilm Reactor. *Water Science & Technology* 59:10:1969-1974. DOI: 10.2166/wst.2009.216.
10. Caitlyn Shea*, Peter Clauwaert, Willy Verstraete, and **Robert Nerenberg** (2008). Adapting a Denitrifying Biocathode for Perchlorate Reduction. *Water Science and Technology* 58:10:1941-1946. DOI: 10.2166/wst.2008.551.
11. Leon Downing* and **Robert Nerenberg** (2008). Sustainable Nitrogen Removal from Wastewater with the Hybrid Membrane Biofilm Process (HMBP): Bench-Scale Studies. *Water Science and Technology* 58:9:473-479. DOI: 10.2166/wst.2008.550.
12. Leon Downing* and **Robert Nerenberg** (2008). Effect of Bulk Liquid BOD Concentration on Activity and Microbial Community Structure of a Nitrifying, Membrane-Aerated Biofilm. *Applied Microbiology and Biotechnology* 81:153-162. DOI: 10.1007/s00253-008-1705-x.
13. Leon Downing* and **Robert Nerenberg** (2008). Effect of Oxygen Gradients on the Activity and Microbial Community Structure of Nitrifying, Membrane-Aerated Biofilm. *Biotechnology and Bioengineering* 101:6:1193-1204. DOI: 10.1002/bit.22018.
14. Leon Downing* and **Robert Nerenberg** (2008). Total Nitrogen Removal in a Hybrid, Membrane-Aerated Activated Sludge Process. *Water Research* 42:14: 3697-3708. DOI: 10.1016/j.watres.2008.06.006.
15. Margaret Dudley*, Anna Salamone*, and **Robert Nerenberg** (2008). Kinetics of a Novel Chlorate Accumulating, Perchlorate-Reducing Bacterium. *Water Research*. 42:10-11:2403-2410. DOI: 10.1016/j.watres.2008.01.009.
16. **Robert Nerenberg**, Yasunori Kawagoshi, and Bruce E. Rittmann (2008). Microbial Ecology of a Perchlorate-Reducing, Hydrogen-Based Membrane Biofilm Reactor. *Water Research*. 42:4-5:1151-1159. DOI: 10.1016/j.watres.2007.08.033.
17. Leon S. Downing* and **Robert Nerenberg** (2007). Kinetics of Microbial Bromate Reduction in a Hydrogen-Oxidizing, Denitrifying Biofilm Reactor. *Biotechnology and Bioengineering* 98:3:543-550. DOI: 10.1002/bit.21442.
18. Leon Downing* and **Robert Nerenberg** (2007). Performance and Microbial Ecology of the Hybrid Membrane Biofilm Process (HMBP) for Concurrent Nitrification and Denitrification of Wastewater. *Water Science & Technology* 55:8-9:355-362.
19. Jinwook Chung, **Robert Nerenberg**, and Bruce E. Rittmann (2007). Evaluation for biological reduction of nitrate and perchlorate in brine water using the hydrogen-based membrane biofilm reactor. *Journal of Environmental Engineering-ASCE* 133 (2): 157-164 FEB 2007. DOI: 10.1061/(ASCE)0733-9372(2007)133:2(157).
20. **Robert Nerenberg**, Yasunori Kawagoshi, and Bruce E. Rittmann (2006). Kinetics of a Hydrogen-Oxidizing Perchlorate-Reducing Bacterium. *Water Research,* 40:17:3290-3296. DOI: 10.1016/j.watres.2006.06.035.
21. Jinwook Chung, **Robert Nerenberg**, and Bruce E. Rittmann (2006). Bio-reduction of Selenate Using a Hydrogen-Based Membrane Biofilm Reactor. *Environmental Science & Technology*, 40:5:1164-1671. DOI: 10.1021/es051251g.
22. Jinwook Chung, **Robert Nerenberg**, César, I. Torres, and Bruce E. Rittmann (2006). Bio-reduction of Soluble Chromate Using a Hydrogen-based Membrane Biofilm Reactor. *Water Research,* 40 (8): 1634-1642. DOI: 10.1016/j.watres.2006.01.049.
23. Bruce E. Rittmann, **Robert Nerenberg**, Kuan-Chun Lee, Issam Najm, Thomas E. Gillogly, Geno E. Lehman, and Samer S. Adham (2004). Hydrogen-Based Hollow-Fiber Membrane Biofilm Reactor (MBfR) for Removing Oxidized Contaminants. *Water Science & Technology* 4:1:127-133.
24. **Robert Nerenberg** and Bruce E. Rittmann (2004). Reduction of Oxidized Water Contaminants with a Hydrogen-Based, Hollow-Fiber Membrane Biofilm Reactor. *Water Science & Technology*. 49:11-21

25. **Robert Nerenberg**, Bruce E. Rittmann, and Issam Najm (2002). Perchlorate Reduction in a Hydrogen Based Membrane-Biofilm Reactor. *Journal of the American Water Works Association* 94:11:103-114
26. **Robert Nerenberg** and Bruce E. Rittmann (2002). Perchlorate as a Secondary Substrate in a Denitrifying Hollow-Fiber Membrane Biofilm Reactor. *Water Science & Technology: Water Supply* 2:2:259-265
27. **Robert Nerenberg**, Bruce E. Rittmann, and William Soucie (2000). Ozone/Biofiltration for Removing MIB and Geosmin. *Journal of the American Water Works Association* 92:12:85-95

Unrefereed Publications (literature reviews)

1. April Gu, Robert Nerenberg, Belinda Sturm, Park Chul, Ramesh Goel (2010). Molecular methods in biological systems. *Water Environment Research*. 82:10:908-930. DOI: 10.2175/106143010X12756668800735
2. Katherine D. McMahon, April Z. Gu, **Robert Nerenberg**, and Belinda Sturm (2009). Molecular methods in biological systems. *Water Environment Research* 81:10 : 986-1002. DOI: 10.2175/106143009X12445568399370
3. Katherine D. McMahon, April Z. Gu, **Robert Nerenberg**, and Belinda Sturm (2008). Molecular methods in biological systems. *Water Environment Research*. 80:10:929-961. DOI: 10.2175/106143008X328536.
4. Katherine D. McMahon, April Z. Gu, **Robert Nerenberg**, and Largus T. Angenent (2007). Molecular methods in biological systems. *Water Environment Research*, 79:10:1109-1151. DOI: 10.2175/106143007X218368
5. Lars Angenent, Katherine McMahon, April Gu. and **Robert Nerenberg** (2006). Molecular methods in biological systems. *Water Environment Research*, 78:6:1084-1115. DOI: 10.2175/106143006X119170

Invited Book Chapters

- Invited co-author (with Bruce Rittmann) on chapter on biological treatment of drinking water for ASCE/AWWA Water Treatment Design handbook (McGraw-Hill) (in press).
- Invited author on Water Environment Federation (WEF) chapter on "Emerging Technologies" in special publication "Fixed–Growth (Biofilm) Reactors" (2010).
- Invited contributing author to Water Environment Federation (WEF) Manual of Practice No. 8, Chapter 14, "Biofilm Reactor Technology and Design" (2009).

Conference Papers

1. Kelly J. Martin, Joshua P. Boltz, **Robert Nerenberg** (2012). The Membrane Biofilm Reactor (MBfR) for Wastewater Treatment: Applications, Design Considerations, and Technology Outlook. *WEFTEC 2012*, New Orleans.
2. Marcelo Aybar, Gonzalo Pizarro, Kelly Martin, Joshua Boltz, Leon Downing, **Robert Nerenberg** (2012). The Air-Based Membrane Biofilm Reactor (MNFR) For Energy Efficient Wastewater Treatment. *WEFTEC 2012*, New Orleans.
3. J.P. Pavissich, B.L. Read-Daily, K. Sandberg, F. Sabba, **R. Nerenberg** (2012). Nitrous Oxide (N_2O) Reduction by Denitrifying Bacteria: Relating Kinetics and Gene Expression. *WEFTEC 2012*, New Orleans.
4. Yue Wang, Pablo Pasten, Charles Bott, **Robert Nerenberg** (2012). Elemental Sulfur (S^o) as a Supplemental Electron Donor for Wastewater Denitrification: Batch and Column Studies. *WEFTEC 2012*, New Orleans.

5. B.L. Read-Daily* and **R. Nerenberg** (2011). Modeling Nitric and Nitrous Oxide Production in Biofilm Systems. *IWA Leading Edge Technology Conference*, Amsterdam, NL
6. B.L. Read-Daily*, **R. Nerenberg** (2011). Kinetics and Microbial Ecology of Nitrous Oxide (N_2O) Reduction by Denitrifying Bacteria. *IWA Leading Edge Technology Conference*, Amsterdam, NL
7. Kelly J. Martin*, Cristian Picioreanu, David Friese, Ryan Overstreet, **Robert Nerenberg** (2011). Multidimensional Modeling of the Hollow-Fiber Membrane Biofilm Reactor. WEFTEC, Los Angeles CA.
8. B.L. Read-Daily* and **R. Nerenberg** (2011). Modeling Nitric and Nitrous Oxide Production in Biofilm Systems. *WEFTEC*, Los Angeles CA.
9. K. J. Martin*, C. Picioreanu, D. Friese, R. Overstreet, **R. Nerenberg** (2011). Optimizing the Design and Operation of the Hollow-Fiber Membrane Biofilm Reactor Using Multidimensional Biofilm Modeling. *IWA Leading Edge Technology Conference*, Amsterdam, NL
10. Yue Wang*, Juan Pablo Pavissich*, Fabrizio Sabba*, Charles Bott, **Robert Nerenberg** (2011). Elemental Sulfur (S^o) as a Supplemental Electron Donor for Wastewater Denitrification. *WEFTEC*, Los Angeles CA.
11. Kelly J. Martin*, Cristian Picioreanu, David Friese, Ryan Overstreet, **Robert Nerenberg** (2011). Multidimensional Modeling of the Hollow-Fiber Membrane Biofilm Reactor. *WEFTEC*, Los Angeles CA.
12. B.L. Read-Daily* and **R. Nerenberg** (2011). Modeling Nitric and Nitrous Oxide Production in Biofilm Systems. *WEFTEC*, Los Angeles CA.
13. B.L. Read-Daily*, **R. Nerenberg** (2011). Kinetics and Microbial Ecology of Nitrous Oxide (N_2O) Reduction by Denitrifying Bacteria. *WEFTEC*, Los Angeles CA.
14. Caitlyn Shea Butler* and **Robert Nerenberg** (2010). Effects of Oxygen Crossover on Microbial Fuel Cell Performance and Microbial Community Structure. *IWA Leading Edge Technology* Conference, Phoenix, AZ
15. Caitlyn Shea Butler*, Peter Clauwaert, Willy Verstraete, and **Robert Nerenberg** (2010). Bioelectrochemical Perchlorate Reduction in a Microbial Fuel Cell (MFC): Optimizing Biocathode pH and Potential *IWA Leading Edge Technology Conference*, Phoenix, AZ
16. K. J. Martin* and **R. Nerenberg** (2010). Guiding the Development of Membrane-Supported Biofilm Processes through Modeling Studies. I*WA/WEF Biofilm Reactor Technology Conference* 2010, Portland, August 2010.
17. B.L. Read-Daily* and **R. Nerenberg** (2010). Nitric and Nitrous Oxide Production and Consumption in Biofilm Processes. *IWA/WEF Biofilm Reactor Technology Conference* 2010, Portland, August 2010.
18. C. Shea Butler* and **R. Nerenberg** (2010). Effects of Oxygen Crossover on Layered, Microbial Fuel Cell Assemblies. *IWA/WEF Biofilm Reactor Technology Conference* 2010, Portland, August 2010.
19. C. Shea Butler*, P. Clauwaert, S. Green, W. Verstraete, and **R. Nerenberg** (2010). Bioelectrochemical Perchlorate Reduction in a Microbial Fuel Cell: Optimizing Cathode pH and Cathode Potential. *IWA/WEF Biofilm Reactor Technology Conference* 2010, Portland, August 2010.
20. Kelly Martin*, Joshua Boltz, Sarah Keithley**, and **R. Nerenberg** (2010). Using Modeling to Guide the Development of Membrane-Supported Biofilm (MBf) Processes. *IWA Wastewater Modeling 2010*, Quebec City, Canada, March 2010.
21. Caitlyn Shea* and **Robert Nerenberg** (2009). Effect of oxygen crossover on microbial fuel cell biofilms. IWA *Biofilm Processes: Fundamentals to Applications 2009*. 9/13-16/2009, Davis, CA. (Platform)
22. Caitlyn Shea*, Peter Clauwaert, Stefan Green, Willy Verstraete, and **Robert Nerenberg** (2009). Bioelectrochemical perchlorate reduction in a microbial fuel cell. IWA *Biofilm Processes: Fundamentals to Applications 2009*. 9/13-16/2009, Davis, CA. (Poster)

23. Kelly J. Martin[*], Sarah Keithley[**], Joshua Bolz, and **R. Nerenberg** (2009). Unique Behavior of Counter-Diffusional Biofilms Grown on Hollow-Fiber Membranes. IWA *Biofilm Processes: Fundamentals to Applications 2009*. 9/13-16/2009, Davis, CA. (Poster)
24. Leon S. Downing[*] and **Robert Nerenberg** (2009). Membrane-Aerated Biofilms: Who is There, What are They Doing, and Why are They Beneficial. *WEF Nutrient Removal 2009*. 6/28-7/1/2009. Washington, DC.
25. Brenda Read-Daily[*], Jennifer Tank, and **Robert Nerenberg** (2009). Stimulating Denitrification of Agricultural Drainage Using Elemental Sulfur: Denitrification Rates and Microbial Community Structure. *WEF Nutrient Removal 2009*. 6/28-7/1/2009. Washington, DC.
26. Caitlyn Shea[*] and **Robert Nerenberg** (2009)**.** BOD and Total Nitrogen Removal from Wastewater Using Microbial Fuel Cells. *WEF Nutrient Removal 2009*. 6/28-7/1/2009. Washington, DC.
27. Leon S. Downing[*] and **Robert Nerenberg** (2008). A Hybrid Membrane-Biofilm Process for Concurrent Nitrification and Denitrification. *AIChE Annual Meeting 2008*. Philadelphia, PA (11/16-21/2008)
28. **Robert Nerenberg** (2008). Reduction of Perchlorate and Other Micropollutants in a Hydrogen-Based, Hollow-Fiber Membrane Biofilm Reactor. *AIChE Annual Meeting 2008*. Philadelphia, PA (11/16-21/2008)
29. Caitlyn Shea[*] and **Robert Nerenberg** (2008). A High-Performance, Air-Cathode Microbial Fuel Cell with Potential for Retrofitting into Activated Sludge Plants. *WEFTEC*. 10/18-22/2008. Chicago, IL.
30. Leon Downing[*], Kyle Bibby[**], Kathleen Esposito, Tom Fascianella, **Robert Nerenberg** (2008). Pilot-Scale Testing of the Hybrid Membrane Biofilm Process (HMBP) for Total Nitrogen Removal from Municipal Wastewater. *WEFTEC*. 10/18-22/2008. Chicago, IL.
31. Brenda Read-Daily[*], Jennifer Tank, and **Robert Nerenberg** (2008). Stimulating Denitrification in Agricultural Headwater Streams by Amending with Elemental Sulfur. *WEFTEC*. 10/18-22/2008. Chicago, IL.
32. Kelly Martin[*], Leon Downing[*], **Robert Nerenberg** (2008). Evidence of Specialized Bromate-Reducing Bacteria in a Hollow Fiber Membrane Bioreactor. *IWA World Water Congress 2008*. 9/7-12/2008 Vienna, Austria.
33. Leon S. Downing[*] and **Robert Nerenberg** (2008). Performance of a Bench-Scale Hybrid Membrane Biofilm Process (HMBP) for Total Nitrogen Removal from Wastewater. *IWA World Water Congress 2008*. 9/7-12/2008 Vienna, Austria.
34. **Robert Nerenberg**, Leon Downing[*], Kyle Bibby[**], Kathleen Esposito, Tom Fascianella (2008). A hybrid membrane-biofilm process for concurrent nitrification and denitrification: bench and pilot-scale studies. *IWA North American Membranes Research Conference*. August 2008. Amherst, MA.
35. Caitlyn Shea[*], Peter Clauwaert, Willy Verstraete, and **Robert Nerenberg** (2008). Adapting a Denitrifying Biocathode for Perchlorate Reduction. *IWA Leading Edge Technology Conference*. June 2008. Zurich, Switzerland.
36. Caitlyn Shea[*] and **Robert Nerenberg** (2008). Microbial Fuel Cells for Total Nitrogen Removal. *IWA Leading Edge Technology Conference*. June 2008. Zurich, Switzerland.
37. Leon S. Downing[*], **Robert Nerenberg** (2008). Sustainable Nitrogen Removal from Wastewater with the Hybrid Membrane Biofilm Process (HMBP): Bench-Scale Studies. *IWA Leading Edge Technology Conference*. June 2008. Zurich, Switzerland.
38. Kelly Martin[*], Leon Downing[*], and **Robert Nerenberg** (2008). Evidence of Specialized Bromate-Reducing Bacteria in a Hollow Fiber Membrane Bioreactor. *IWA Leading Edge Technology Conference*. June 2008. Zurich, Switzerland.
39. Leon S. Downing[*], Kyle J. Bibby[**], Tom Fascianella, Kathleen Esposito, and **Robert Nerenberg** (2008). The Hybrid Membrane Biofilm Process for TN Removal from Wastewater: Bench and

Pilot Scale Studies. *EWRI World Environmental & Water Resources Congress*. May 2008. Honolulu, HI.

40. Caitlyn Shea* and **Robert Nerenberg** (2008). Performance of Air-Cathode Microbial Fuel Cells with Layered-Electrode Assemblies. *IWA Young Professionals Research Conference*. June 2008. Berkeley, CA.
41. Kelly Martin*, Leon Downing*, and **Robert Nerenberg** (2008) Evidence of Specialized Bromate-Reducing Bacteria in a Hollow Fiber Membrane Bioreactor. *IWA Young Professionals Research Conference*. June 2008. Berkeley, CA.
42. Leon S. Downing* and **Robert Nerenberg** (2007). The Hybrid Membrane Biofilm Process (HMBP): A Novel Technology for Upgrading Activated Sludge Plants to Achieve Biological Nitrogen Removal *WEFTEC 2007*. October 2007. San Diego, CA.
43. Leon Downing* and **Robert Nerenberg** (2007). The Hybrid Membrane Biofilm Process (HMBP): A Novel Technology for Upgrading Activated Sludge Plants to Achieve Biological Nitrogen Removal *IWA/WEF Nutrient Removal 2007: The State of the Art*. Baltimore, MD. CD ROM, 12 pages.
44. Leon Downing* and **Robert Nerenberg** (2006). Microbial Ecology and Performance of the Hybrid Membrane Biofilm Reactor (HMBP) for Concurrent Nitrification and Denitrification. Proceedings of *IWA Biofilm Systems VI*, Amsterdam. CD ROM, seven pages.
45. Leon Downing* and **Robert Nerenberg** (2006). Bromate Reduction in a Hydrogen-Based, Hollow-fiber Membrane-Biofilm Reactor. Proceedings of *IWA Biofilm Systems VI*, Amsterdam. CD ROM, eight pages.
46. Leon Downing* and **Robert Nerenberg** (2006). Concurrent Nitrification, Denitrification, and BOD Removal in a Hybrid Membrane Biofilm Reactor. Proceedings of *IWA World Water Congress*, Beijing, CD-ROM, eight pages
47. Leon Downing* and **Robert Nerenberg** (2006). Microbial Bromate Reduction in a Hydrogen-Based, Membrane Biofilm Reactor: Inhibitory Mechanisms. Proceedings of *AWWA Annual Conference and Exposition*, San Antonio TX. 11 pages.
48. Leon Downing* and **Robert Nerenberg** (2006). Reduction of Bromate to Bromide via Hydrogen Oxidizing Bacteria. Proceedings of *American Water Works Association Inorganic Contaminants Workshop*, Austin, TX. Nine pages.
49. **Robert Nerenberg** (2006). Challenges and Opportunities in Working with Minority/Overseas REU Students. Proceedings of *American Society for Engineering Education Annual Conference*, Chicago. Five pages.
50. **Robert Nerenberg** (2005). Membrane Biofilm Reactor for Water and Wastewater Treatment. Proceedings of *Borchardt Conference*, University of Michigan. CD-ROM, 20 pages.
51. Bruce Rittmann, **Robert Nerenberg**, Beverley Stinson, Dimitrios Katehis, Echo Leong, and James Anderson (2004). Hydrogen-Based Membrane Biofilm Reactor for Wastewater Treatment. Proceedings of *IWA Leading Edge Technologies Conferenc*e, Prague, Czechoslovakia. Eight pages.
52. James Anderson, Beverley Stinson, Bruce Rittmann, and **Robert Nerenberg** (2004). Innovative Biofilm Membrane Reactor for Emerging Contaminants and Nitrogen Removal from Wastewater. Proceedings of *New York Water Environment Association Annual Conference*. New York, NY. Eight pages.
53. **Robert Nerenberg**, Bruce E. Rittmann, Yasunori Kawagoshi, Thomas E. Gillogly, Geno E. Lehman, Samer S. Adham (2003). Microbial Ecology of a Perchlorate-Reducing, Hollow-Fiber Membrane Biofilm Reactor. Proceedings of *American Society for Microbiology Biofilms 2003 Conference*. Victoria, Canada. Abstract.
54. **Robert Nerenberg**, Bruce E. Rittmann (2003). Reduction of Oxidized Water Contaminants with a Hydrogen-Based, Hollow-Fiber Membrane Biofilm Reactor. Proceedings of *IWA Biofilm Congress*, Cape Town, South Africa. Eight pages.

55. **Robert Nerenberg** and Bruce E. Rittmann, Thomas E. Gillogly, Geno E. Lehman, and Samer S. Adham (2003). Perchlorate Reduction using the Hollow-Fiber Membrane Biofilm Reactor: Kinetics, Microbial Ecology, and Pilot-Scale Studies. Proceedings of *Battelle In Situ and On-Site Bioremediation Symposium*. Orlando, FL. CD-ROM, Eight pages.
56. Bruce E. Rittmann and **Robert Nerenberg**, Kuan-Chun Lee, Issam Najm, Thomas E. Gillogly, Geno E. Lehman, and Samer S. Adham (2002). Hydrogen-based, Hollow Fiber Membrane Biofilm Reactor (HFMBfR) for Removing Oxidized Contaminants. International Specialized Conference for Densely Populated Urban Areas, Hong Kong, China. Nine Pages.
57. **Robert Nerenberg** and Bruce E. Rittmann (2001). Perchlorate as a Secondary Substrate in a Denitrifying Hollow-Fiber Membrane Biofilm Reactor. Proceedings of *International Water Association Berlin 2001 Conference*, Berlin, German. CD-ROM, Eight pages.
58. **Robert Nerenberg** and Bruce E. Rittmann (2001). Concurrent Perchlorate and Nitrate Reduction in a Novel, Hollow Fiber Membrane Biofilm Reactor. Proceedings of *American Water Works Association Annual Conference*, Washington, DC. CD-ROM, 19 pages.
59. Bruce E. Rittmann, **Robert Nerenberg**, and Issam Najm (2000). Autohydrogenotrophic Perchlorate Reduction. *Proceedings of the American Water Works Association Inorganic Contaminants Workshop*, Albuquerque, NM, conference proceedings, Eight Pages.
60. **Robert Nerenberg**, Carol J. Miller, and Carrie Turner (1997). Spreadsheet Models for Groundwater Flow and Contaminant Transport. Proceedings of *AWRA Symposium on Water Resources Education, Training, and Practice*, Keystone, CO, 10 pages.
61. **Robert Nerenberg** and Robert Butterworth (1996). Using Chicago's Distribution/Tunnel Model for Practical Regional Decisions. Proceedings of *AWWA Computer Conference*, Chicago, IL, pg. 233-237.
62. **Robert Nerenberg** and Krishna Mayenkar (1996). The Environmental Audit - First Step Towards Strategic Environmental Management. *Proceedings of Power-Gen International Conference*, Orlando, FL, pg. 121-145.

Conference Abstracts

[*]Advised graduate student, [**]Advised undergraduate student

1. **Robert Nerenberg**, Leon Downing, Kelly Martin[*], Caitlyn Butler[*], and Brenda Read-Daily[*] (2011). Advances in Hollow-Fiber Membrane Biofilm Reactor (MBfR) Technology for Water and Wastewater Treatment. Borchardt Conference on Water and Wastewater Technology, Ann Arbor, MI.
2. Yue Wang[*], Juan Pablo Pavissich[*], and **Robert Nerenberg** (2010). Elemental sulfur (S^o) as a supplemental electron donor for wastewater denitrification. IWEA, Indianapolis, IN
3. Downing, L.[*], Martin, K.[*], and **Nerenberg, R.** (2009). The who, what, and how of biological bromate removal AWWA ACE 2009.
4. Caitlyn Shea[*] and **Robert Nerenberg** (2008). Air-Cathode Microbial Fuel Cells with Layered-Electrode Assemblies. *Microbial Fuel Cells First International Symposium*. Penn State University (5/27-29/2008)
5. Caitlyn Shea and **Robert Nerenberg** (2008). Microbial Fuel Cells for Total Nitrogen Removal. *Microbial Fuel Cells First International Symposium*. Penn State University (5/27-29/2008)
6. Caitlyn Shea[*], Peter Clauwaert, Willy Verstraete, and **Robert Nerenberg** (2008). Adapting a Denitrifying Biocathode for Perchlorate Reduction. *Microbial Fuel Cells First International Symposium*. Penn State University (5/27-29/2008)
7. Leon S. Downing[*], Stefan J. Green, and **Robert Nerenberg** (2007). Performance and Microbial Ecology of the Hybrid Membrane Biofilm Process (HMBP) for concurrent nitrification and denitrification of wastewater. *AEESP Annual Conference*, August 7, 2007. Blacksburg, VA. Abstract, oral presentation.

8. Caitlyn Shea* and **Robert Nerenberg** (2007). Hollow-Fiber Membrane Microbial Fuel Cells: Retrofitting Activated Sludge for Direct Production of Electricity. Indiana Water Environment Association Annual Conference 2007, November 13, 2007.
9. Brenda Read*, Stefan Green, and **Robert Nerenberg** (2007). Stimulating Denitrification in Agricultural Headwater Streams. *ASM General Conference*, May 2007, Toronto. (Poster)
10. Caitlyn. Shea*, Stefan Green, and **Robert Nerenberg** (2007). Microbial Fuel Cells: Changes in Microbial Community Structure as a Function of Anode Potential. *4th ASM Conference on Biofilms*. March 2007, Quebec City. (Poster).
11. Kelly Martin*, Leon Downing*, Stefan Green, and **Robert Nerenberg** (2007). Microbial Ecology of Bromate Reduction in a Hydrogen-Oxidizing Biofilm. *4th ASM Conference on Biofilms*. March 2007, Quebec City. (Poster).
12. Leon Downing*, Stefan Green, and **Robert Nerenberg** (2007). Performance and Microbial Ecology of the Hybrid Membrane Biofilm Process (HMBP) for Concurrent Nitrification and Denitrification of Wastewater. *4th ASM Conference on Biofilms*. March 2007, Quebec City. (Poster).
13. Leon S. Downing* and **Robert Nerenberg** (2007). Concurrent Nitrification and Denitrification with a Hybrid Membrane Biofilm Process. *North American Membrane Society 2007*. May 16, 2007. Orlando, FL. Abstract, oral presentation.
14. Margaret Dudley*, Stefan Green, and **Robert Nerenberg** (2007). Determining the Cause of Chlorate Accumulation in *Dechlorosoma* HCAP-C, a Novel Perchlorate-Reducing Bacterium. *ASM General Conference*, May 2007, Toronto. (Poster).
15. **Robert Nerenberg** and Caitlyn Shea* (2007). Microbial Fuel Cells for Sustainable Energy Production from Wastewater. *Purdue University 2007 Bioenergy Symposium*. May 2007, West Lafayette, IN. Abstract, oral presentation.
16. Leon Downing* and **Robert Nerenberg** (2006). Concurrent Nitrification, Denitrification, and BOD Removal in a Hybrid Membrane-Biofilm Reactor. IWEA Annual Conference. Indianapolis, IN. (Abstract)
17. **Robert Nerenberg** (2006). Membrane Biofilm Reactors for Water and Wastewater Treatment. IWEA Annual Conference. Indianapolis, IN. (Abstract)
18. Anna Salamone* and **Robert Nerenberg** (2006). Novel Perchlorate-Reducing Bacteria Accumulate High Levels of Chlorate. Proceedings of *ASM General Meeting*, Orlando. Abstract.
19. Beverley Stinson, Bruce Rittmann, **Robert Nerenberg**, Dimitrios Katehis, Echo Leong, and James Anderson (2005). Innovative Membrane Biofilm Reactor for Emerging Contaminant and Nitrogen Removal from Wastewater. Proceedings of *New England Water Environmental Association Annual Conference*, Boston. Three pages.
20. **Robert Nerenberg**, Yasunori Kawagoshi, and Bruce Rittmann (2004). Microbial Ecology of a Perchlorate-Reducing Biofilm Reactor with Nitrate as a Primary Electron Acceptor. Proceedings of *10th International Symposium on Microbial Ecology ISME 10*. Cancun, Mexico. Abstract.
21. **Robert Nerenberg**, Yasunori Kawagoshi, and Bruce E. Rittmann (2004). Kinetics and Microbial Ecology of Perchlorate-Reducing Bacteria: Implications for Remediation. Proceedings of *AEHS Conference*, University of Massachusetts, Amherst. Abstract.
22. Yasunori Kawagoshi, **Robert Nerenberg**, and Bruce E. Rittmann. Bacterial Community of Perchlorate Reducing, Denitrifying Hollow-Fiber Membrane Biofilm Reactor (2003). Proceedings of *Japan Society on Water Environment*. Prefectural University of Kumamoto, Kumamoto, Japan. Abstract.
23. **Robert Nerenberg** and Bruce E. Rittmann (2002). Hydrogen-Based, Hollow-Fiber Membrane Biofilm Reactor for Reduction of Oxidized Contaminants. Proceedings of AEESP 2002 Education and Research Conference. Toronto, Canada. Abstract.

24. Bruce E. Rittmann, **Robert Nerenberg**, Thomas E. Gillogly, Geno E. Lehman, and Samer S. Adham (2002). Membrane Biofilm Reactors for Perchlorate Removal. Proceedings of *Microfiltration III Conference*, Contra Costa, CA. Abstract.

7. INVITED LECTURES AND ADDRESSES

1. Counter-diffusional biofilms: unique behavior, and role in novel water and wastewater treatment processes. **Pontificia Universidad Catolica de Chile (PUC).** (3/14/12)
2. Counter-diffusional biofilms: unique behavior, and role in novel water and wastewater treatment processes. **Ecole Polytecnique Federale de Lausanne (EPFL)**, Lausanne, Switzerland. (5/20/2011).
3. Counter-diffusional biofilms: unique behavior, and role in novel water and wastewater treatment processes. **Swiss Federal Institute for Aquatic Science and Technology (EAWAG)**, Dübendorf, Switzerland. (5/15/2011)
4. Hollow-Fiber Membrane Processes for Sustainable Wastewater Treatment. Seminar, Civil and Environmental Engineering, **University of Manitoba**, Winnipeg, Canada (11/20/09).
5. Hollow-Fiber Membrane Processes for Sustainable Wastewater Treatment. Seminar, Civil and Environmental Engineering, **Stanford University** (6/22/09).
6. Sustainable Nitrogen Removal from Wastewater using Membrane-aerated Biofilms. Presentation at Purdue University – **Petroleum Environmental Research Forum (PERF) Workshop** (5/21/09)
7. Hollow-Fiber Membrane Processes for Sustainable Wastewater Treatment. **UNESCO-IHE**, Delft, The Netherlands (5/14/09)
8. Hollow-Fiber Membrane Processes for Sustainable Wastewater Treatment. Kluyer Lecture at **Technical University of Delft**, Delft, The Netherlands (5/13/09)
9. Hollow-Fiber Membrane Processes for Sustainable Wastewater Treatment. Seminar at Laboratory of Microbial Ecology and Technology (LabMET), **Ghent University**, Belgium (5/11/09)
10. Hollow-Fiber Membrane Processes for Sustainable Wastewater Treatment. Seminar at **EAWAG**, Zurich, Switzerland (5/8/09)
11. Total Nitrogen Removal in the Hybrid Membrane-Biofilm Process. Takashi Asano Seminar, **University of California at Davis** (01/12/09)
12. Reduction of Perchlorate and Other Micropollutants in a Hydrogen-Based, Hollow-Fiber Membrane Biofilm Reactor. **AIChE Annual Meeting**, Philadelphia, PA (11/16-21/2008)
13. A Hybrid Membrane-Biofilm Process for Concurrent Nitrification and Denitrification: Bench and Pilot-Scale Studies. **IWA North American Membrane Research Conference**, Amherst, MA, (8/2008).
14. Total Nitrogen Removal in the Hybrid Membrane-Biofilm Process. **The Metropolitan Water Reclamation District of Greater Chicago** seminar (8/22/08).
15. Total Nitrogen Removal in the Hybrid Membrane-Biofilm Process. Seminar, Department of Civil and Environmental Engineering, **Rice University** (5/2/2008).
16. Total Nitrogen Removal in the Hybrid Membrane Biofilm Process. Seminar, Department of Civil, Architectural, and Environmental Engineering, **University of Texas at Austin** (5/1/2008).
17. Hollow-Fiber Membrane Biofilm Reactors for Advanced Water and Wastewater Treatment. Warren Lecture at the **University of Minnesota**, Minneapolis (1/2008).
18. Hollow-Fiber Membrane Biofilm Processes for Environmental Remediation. Department of Biology, **Loyola University**, Chicago (2007).
19. Microbial Fuel Cells for Sustainable Energy Production from Wastewater. Purdue Energy Symposium, **Purdue University** (2007).

20. Hollow-Fiber Membrane Biofilm Reactors for Advanced Water and Wastewater Treatment. Laboratory of Microbial Ecology and Technology (LabMET), **University of Ghent**, Belgium (2006).
21. Membrane Biofilm Reactors for Water and Wastewater Treatment. Department of Civil and Environmental Engineering, **The Pennsylvania State University**, State College, PA (2006).
22. Membrane Biofilm Reactors for Water and Wastewater Treatment. **Borchardt Conference**, Ann Arbor, Michigan (2005).
23. Biological Reduction of Perchlorate in Drinking Water Using a Hollow-Fiber Membrane Biofilm Reactor. Environmental Engineering seminar, **University of Illinois, Urbana Champaign** (2004)
24. Kinetics and Microbial Ecology of Perchlorate-Reducing Bacteria: Implications for Remediation. **AEHS Conference**, University of Massachusetts, Amherst. (2004).

8. GRANTS AND CONTRACTS

Grants and Sponsored Programs

1. Feasibility of Sulfite and Sulfur as Supplemental Electron Donors for Wastewater Denitrification – Bench-Scale Studies. Hampton Roads Sanitation District (HRSD). **$100K**. **R. Nerenberg, PI**. 2011 – 2012.
2. Low-Energy Wastewater Treatment via Membrane-Aerated Biofilm Reactors (MABRs). WateReuse Foundation. **$25K. R. Nerenberg, PI**. 2011 - 2012.
3. Quantifying Fugitive Greenhouse Gas Emissions from Biofilm Systems. Water Environmental Research Foundation (WERF). **$122K. R. Nerenberg, PI,** Kartik Chandran co-PI. 2011 – 2013
4. Feasibility of Sulfite as a Supplemental Electron Donor for Wastewater Denitrification. Hampton Roads Sanitation District (HRSD). **$47K**. **R. Nerenberg, PI**. 2010 – 2011.
5. Elemental Sulfur (S^o) as a Supplemental Electron Donor for Wastewater Denitrification. Hampton Roads Sanitation District (HRSD). **$70K**. **R. Nerenberg, PI**. 2010 – 2011.
6. Mathematical Modeling and Experimental Studies on Membrane-Supported Biofilm Reactors (MBfRs) in Spiral Assemblies. Applied Process Technology, Inc. **$46K**. **R. Nerenberg,** PI. 4/2010 – 12/2010.
7. Energy efficient and sustainable aquaculture water treatment using microbial fuel cells and membrane-supported biofilms – Seed Grant. Illinois Indiana Sea Grant. **$10K. R. Nerenberg, P.I.** 2010 – 2011.
8. CAREER: Dynamic Structure and Function of Biofilms for Wastewater Treatment. National Science Foundation. **$400K. R. Nerenberg, PI**. 2010 – 2015.
9. The Hybrid Membrane Biofilm Process (HMBP) for Wastewater Treatment: Research on Membrane Materials and Configurations. Applied Process Technology, Inc., **$65K**. **R. Nerenberg, PI**. 2008 – 2010.
10. Novel Membrane-aerated Anammox Process for Nitrogen Removal from Wastewater. Notre Dame Faculty Research Program. University of Notre Dame, **$10K**. **R. Nerenberg, PI**. (1/1/08 – 12/31/08)
11. Hollow-Fiber Membrane Microbial Fuel Cells (HFM-MFCs) for Electricity Production from Wastewater. (National Science Foundation SGER), **$75K**. **R. Nerenberg, PI** (7/1/07-6/30/08).
12. Integrated Membrane Biofilm Reactor for Total Nitrogen Removal from Wastewater. Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET - NOAA), **$260K**. **R. Nerenberg, PI**; J. Anderson (Metcalf & Eddy), subconsultant; Reid Bowman (Applied Process Technology), subcontractor (2005- 2008).
13. Nitrogen removal from headwater streams using elemental sulfur. CICEET - NOAA, **$24K**. **R. Nerenberg, PI**, Jennifer Tank, Co-PI (Biological Sciences) (2005- 2006).
14. Laboratory and Field Tests on an Oxygen-based Membrane Biofilm Reactor for Total-Nitrogen Removal from Wastewater. Metcalf & Eddy, **$14K**. **R. Nerenberg, PI**. (June- December 2005).

9. STUDENTS DIRECTED

Current Doctoral Students (Total: 6 doctoral students)

1. Kelly Martin. Expected completion: August 2012.
2. Juan Pablo Pavissich. Expected completion: August 2013
3. Yue Wang. Expected completion: August 2014
4. Fabrizio Sabba. Expected completion: August 2015
5. Jared Johnson. Expected completion: August 2015
6. Marcelo Aybar. Expected completion: August 2016

Doctoral Dissertations Directed (Total: 3 Ph.D. dissertations)

1. Brenda Read-Daily (Ph.D. defended July 2011). *Nitrous Oxide Formation and Consumption by Denitrifying Bacteria in Wastewater Treatment.* As of August, 2012, Assistant Professor (tenure track) at Elizabethtown University, Elizabethtown, PA
2. Caitlyn Shea. (Ph.D. defended November, 2009). *Fundamental and Applied Studies of Microbial Fuel Cells for Sustainable Water and Wastewater Treatment*. Current position: Assistant Professor (tenure track) at University of Massachusetts at Amherst, Amherst MA.
3. Leon Downing (Ph.D. defended May 2008). *The Hybrid Membrane Biofilm Process: A Novel System for Achieving Nitrogen Removal from Wastewater*. Current position: Wastewater Process Engineer, Donahue and Associates, Milwaukee, WI.

Master's Theses Directed (Total: 3 M.S. theses)

1. Brenda Read-Daily (M.S. completed 2007). *Stimulating Denitrification in Agricultural Headwater Streams using Elemental Sulfur*.
2. Margaret Dudley (2007). *Microbial Ecology of Perchlorate-Reducing Bacteria that Accumulate High Levels of Chlorate*.
3. Anna Salamone (2006). *Kinetics of a Perchlorate-Reducing Bacterium that Accumulates High Levels of Chlorate*.

Undergraduate Researchers Advised

2012: Kyle Sandberg, Elyse Stachler
2011: Kyle Sandberg, Frank Schadt, Caroline Dikibo
2010: Sarah Keithley, Kyle Sandberg, Gabriela Elizondo, Caroline Dikibo
2009: Amanda Martell, Patricia Wilbur, Lauren Lopez, Sarah Keithley
2008: Kyle Bibby, Patricia Wilbur, Chad Knapke
2007: Kyle Bibby, Megan McCullough, Patricia Wilbur
2006: Kyle Bibby, Amanda Martell
2005: Kyle Bibby, Amanda Martell
2004: Amanda Martell

High School Students Advised

- Hosted female student from Marian High School for microbial fuel cell research – received second/third place award from Indiana Science and Humanities Symposium (2008-2009).
- Hosted African American high school student through EMSI outreach from Nov. 2004 - May 2006. Received second place in Indiana Academy of Science competition (2005-2006)

High School Teachers (RETs) Advised

- Nevin Longenecker, Adams High School (2005, 2006, 2010)

- John Bogucki, Clay Township High School (2009)

Distinctions and Awards of Advised Students

External

- Scholarship to attend "E.C.–U.S. Molecular Biology for the Environment." Competitively selected by U.S. Biotechnology Task Force for 2-week course in Lausanne, Switzerland. Sponsored by DOE and the European Union. Juan Pablo Pavissich (2012).
- Indiana Water Environment Association (IWEA) Besozzi Graduate Scholarship ($2,000). Kelly Martin (2011)
- Fellowship to attend Woods Hole Summer Microbial Diversity Course ($4,000). Juan Pablo Pavissich (2010).
- First-place student paper award, University Forum. Texas Water Association Annual Conference. Leon Downing (2009).
- U.S. Biotechnology Task Force (DOE) E.C.-U.S. Transatlantic Biotechnology Fellowship (~$5,000) for one-month visit to Willy Verstraete's lab at the University of Ghent, Belgium. Caitlyn Shea (2007).
- Competitively selected for month-long Hopkins Microbiology Course (Stanford University). Kelly Martin (summer of 2007).
- Indiana Water Environment Association (IWEA) Besozzi Graduate Scholarship ($2,000). Leon Downing (2007)
- NSF Graduate Student Fellowship ($160,000). Leon Downing (2005-2008)

Internal

- Center for Environmental Science and Technology (CEST) Graduate Student Fellowship (~$11,000, $18,000). Kelly Martin (2010, 2012).
- Center for Aquatic Conservation (CAC) Graduate Student Fellowship (~$18,000). Juan Pablo Pavissich (2010).
- NSF Environmental Molecular Science Institute (EMSI) fellowship (~$10,000). Caitlyn Shea (2009).
- CEST Graduate Student Fellowship (~$10,000). Brenda Read (2009).
- CEST Graduate Student Fellowship for (~$10,000). Caitlyn Shea Butler (2008).
- Center for Aquatic Conservation (CAC) Graduate Student Fellowship (~$8,000). Brenda Read (2007)
- Slatt Fellowship for Undergraduate Research ($5,000). Kyle Bibby (2006).
- Kaneb "Excellence in Teaching" award (2006). Caitlyn Shea Butler.
- Kaneb "Excellence in Teaching" award (2005). Leon Downing.

10. TEACHING

Course Development

- CE 40340 Wastewater Design (4 credits) (adapted from previous 3-credit course)
- CE 60330 Environmental Biotechnology (3 credits)
- CE 60370 Advanced Techniques in Environmental Biotechnology (3 credits)

Semester	Course No.	% responsibility	No. students	Evaluations (Q17)
Spring 2011	CE 40340	100	9	CIF 3.6/5
Fall 2010	CE 60330	100	5	CIF 3.8/5
Spring 2010	CE 40340	100	8	CIF 4.2/5

Fall 2009	CE 60330	100	9	CIF 4.0/5
Spring 2009	CE 40340	100	11	CIF 3.8/5
Fall 2008	CE 60370	100	3	TCE 4.00/4
Spring 2008	CE 40340	100	10	TCE 3.52/4
Fall 2007	CE 60330	100	6	TCE 3.73/4
Spring 2007	CE 40340	100	6	TCE 3.33/4
Fall 2006	CE 60330	100	2	TCE 4.00/4
Spring 2006	CE 40340	100	4	TCE 3.20/4
Fall 2005	CE 60330	100	3	TCE 4.00/4
Spring 2005	CE 40340	100	12	TCE 3.33/4
Fall 2004	CE 60330	100	4	TCE 3.40/4

11. SERVICE

Service to Department

- Search committee chair for environmental engineering faculty (Fall 2012)
- Search committee member for searchers for geoscience and actinide science searches (Fall 2012)
- Prepared teaching reports for two candidates for renewal and one candidate for promotion (2011, 2012), and research report for one candidate for promotion (2012)
- Led effort to develop and implement dual degree agreement between CEGEOS and Department of Hydraulics and Environmental Engineering at Pontifical Catholic University of Chile
- Member, Environmental Fluid Dynamics search committee (2012)
- Member, ad hoc committee on Graduate Curriculum (2011)
- Member, ad hoc committee on Departmental Strategic Plan (2011)
- Member, ad hoc committee for Committee oversight (2011)
- Director of Graduate Studies (March 2010 - present)
- Member, ad hoc committee on graduate student recruitment (Fall 2009)
- Initiated and coordinated/co-coordinated departmental Environmental seminar (Fall 2004 - present)
- Chair, search committee for Environmental Engineering faculty (2008/2009)
- Member, search committee for Environmental Engineering faculty (2006/2007)
- Member, search committee for Massman chair (2007/2008)
- Member, search committee for Massman chair (2006/2007)
- Member, search committee for Environmental Faculty (2006 – 2007)
- Chair, ABET Review Committee, Environmental Engineering concentration (2006 - present)
- Member, ad hoc Undergraduate Curriculum committee (8/2004 – 10/2004)
- Member, ad hoc committee on requirements for MS degrees (4/2004 – 6/2004)

Service to College

- Led effort to develop and implement dual degree agreement between Notre Dame Engineering and Pontifical Catholic University of Chile (2010 – present)
- Member, search committee for Energy for Separations committee for Notre Dame Energy Center (2010 – 2011).
- Member, search committee for Ecologist position in Department of Biological Sciences (2009-2010)
- Member of committee for new Interdisciplinary Design Course (Jay Brockman, chair) (2008 – 2009)

- Member of committee for forming the Bioengineering program (Mark McCready, chair) (2005 – 2006)
- Member of committee for new Learning Center design (Steve Silliman, chair) (2006 – 2007)

Service to University

- Led effort to develop and implement dual degree agreement between Notre Dame Engineering and Pontifical Catholic University of Chile (2010 – present)
- Advisory Board Member for Center for Environmental Science and Technology (CEST) (2010 to present)
- Mentor for Hispanic engineering students under Notre Dame's *Building Bridges* program (2004 – 2006)
- Judge for Notre Dame's GSU Graduate Research Symposium (2008)
- Proposal reviewer for CEST fellowship applicants (2004, 2005)

Service Outside University

Editorial Boards

Editorial board member for *Reviews in Environmental Science and Biotechnology*, Springer. Impact Factor: 3.321 (2008). Rank 18 of 163 in subject category "Environmental sciences". (2009 – 2011).

Service to Research Community

Association of Environmental Engineering and Science Professors (AEESP) Awards Committee member, 2011 – 2014

WEF Municipal Wastewater Design Committee, Program Committee member, 2009 - 2013

NSF Review Panels

- Panel reviewer for NSF's CBET unsolicited proposal, Environmental Engineering program (May 2010)
- Panel reviewer for NSF's CBET unsolicited proposal, Environmental Engineering program (November 2009)
- Panel reviewer for NSF's CBET unsolicited proposal, Energy for Sustainability program (December 2007).
- Panel reviewer for NSF's BES unsolicited proposal (February 2006).

Ad-hoc Proposal Reviews

- Proposal reviewer for Sawiris Scholarship, by invitation from ETH Zurich (2012).
- Proposal reviewer for CONICYT (Chile) unsolicited proposal (2008, 2009, 2011)
- Proposal reviewer for Natural Resource and Applied Sciences Endowment Fund, Canada (October 2009).
- Proposal reviewer for NSF CBET unsolicited proposal, Energy for Sustainability program (June 2009).
- Proposal reviewer for New York Sea Grant unsolicited proposal (2008).
- Proposal reviewer for CICEET unsolicited proposals (2007, 2004).
- Proposal reviewer for Massachusetts Water Resources Research Center (December 2004).

Project Advisory Committees

- Technical Advisory Committee member for NYSERDA grant on microbial fuel cells (2009).
- Member of Project Advisory Committee (PAC) for WateReuse Foundation research project *Investigating the Feasibility of an MBfR to Achieve Low Nitrogen Levels for Water Reclamation and Reuse (2006-2009).*
- Project Advisory Committee for AWWARF project #3137 "Biological Destruction of Perchlorate and Nitrate in Ion Exchange Concentrate" (2005).

Conference Organization

- Organizing committee member for *International Water Association (IWA) Microbial Ecology and Water Engineering* conference. July 2013, Ann Arbor, MI.
- Program Committee member for *IWA Biofilm Reactor Technology Conference*. May 2013, Paris, France.
- Scientific committee member for *IWA/WEF Biofilm Reactor Technology Conference*, Portland, OR. August 2010.
- Member of Water Environment Federation (WEF) Municipal Wastewater Treatment Symposium--Program Committee (2008 – 2013)
- Invited as support group member, submission referee, and session moderator for International *Water Association (IWA) 5th World Water Congress*, Beijing, China, 2006.

External Member of Doctoral Committees at Other Universities

- External committee member for Paula Guerra, Ph.D. student from the Pontifical Catholic University of Chile (PUC). Research proposal title: *Formation of reactive particles in fluvial confluences: chemical-hydrodynamic interactions controlling the fate of arsenic in rivers*. Advisor: Pablo Pasten (August 2011).
- External committee member for Paulina Rios, Ph.D. student from the Pontifical Catholic University of Chile (PUC). Research proposal title: *Arsenic geochemistry in the Lluta river: probing the formation, reactivity and fate of arsenic rich sediments*. Advisor: Pablo Pasten (November 2010).
- External committee member for Ph.D. student at the University of British Columbia, Canada. Thesis title: "*Two stage membrane-biofilm reactors (MBfRs) for nitrification and hydrogenotrophic denitrification*". Advisor: Jan Oleszkiewicz. (November 2009).
- External committee member for Ph.D. student at the University of Cincinnati. Thesis title: "*Reducing Biofouling in Membrane Bioreactors Treating Synthetic Early Planetary-Base Wastewater*". Advisor: Dan Oerther. (July 2007).

Journal Reviewer

Typically review 12 – 18 manuscripts a years for Water Research, Environmental Science & Technology, Biotechnology and Bioengineering, Science, Applied and Environmental Microbiology, International Society for Microbial Ecology (ISME) Journal, Applied Microbiology and Biotechnology, Bioresource Technology, Journal of Membrane Science, Journal of the American Water Works Association, Journal of Environmental Engineering, Water Environment Research, Environmental Technology, and others (2003 – present).

Service to Local Community

Technical advisor to City of South Bend Public Works on their program to pilot-test the use of peracetic acid as a disinfectant for combined sewer overflows.

Served as member of City of South Bend's *Green Ribbon Commission* to advise City on sustainable energy and carbon footprint issues (2009).

12. PATENTS AND IP (3 patents and 3 provisional patents)

- Provisional Patent: "Hybrid Membrane-Biofilm Process for Total Nitrogen Removal" (University of Notre Dame, March 2008)
- Provisional Patent: "Hybrid Membrane Biofilm Process for Total Nitrogen Removal from Wastewater" (University of Notre Dame, November 2005).
- Provisional Patent: "Improved Perchlorate Reduction via Analog Addition." (University of Notre Dame, March 2004).
- U.S. Patent No. 7,632,415 (with Dr. Bruce Rittmann and Cesar Torres): "Apparatus and methods for water treatment", issued December 15, 2009
- U.S. Patent No. 7,338,597 (with Dr. Bruce Rittmann and Cesar Torres): "Apparatus for Water Treatment", issued March 4, 2008
- U.S. Patent No. 7,186,340 (with Dr. Bruce Rittmann): "Perchlorate Reduction and Related Water Treatment Methods." Issued March 6, 2007

13. OTHER

Professional Engineering (PE) license, State of Wisconsin (1995 – present)