KELVIN B. GREGORY, Ph.D.

Professor, Carnegie Mellon University
Department of Civil & Environmental Engineering
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Education

2002 Ph.D. in Civil and Environmental Engineering, The University of Iowa
1999 Microbial Diversity, Woods Hole Marine Biological Laboratory
1997 M.S. in Civil and Environmental Engineering, The University of Iowa
1995 B.S. in Biological Systems and Agricultural Engineering, University of Nebraska

Positions

2016 – Curr.	Professor, Carnegie Mellon University, Pittsburgh, PA.
2014 – Curr.	Profesor de Catedra, Universidad de los Andes, Bogota, Colombia
2012 – 2016	Associate Professor, Carnegie Mellon University, Pittsburgh, PA
2006 – 2012	Assistant Professor, Carnegie Mellon University, Pittsburgh, PA
2002 – 2006	Post-doctoral Research Associate, Center for Environmental Biotechnology, University of Massachusetts, Amherst, MA. (Advisor: Derek R. Lovley)
1997 - 2002	Graduate Research Fellow, The University of Iowa, Iowa City, IA. (Advisors: Gene. F. Parkin & Michelle M. Scherer)
1995 - 1997	Graduate Research Assistant, The University of Iowa, Iowa City, IA. (Advisor: Gene F. Parkin)
1995	Water Resources and Sustainable/Appropriate Technology Engineer Non-government aid organization in Rayones, Mexico

Professional Interests

Research and teaching in environmental engineering with an emphasis in environmental microbiology and biogeochemistry. Research areas include management of produced water from oil and natural gas production, microbial interactions with nanomaterials, microbe-surface interactions for energy and remediation, microbial ecology of natural and engineered systems and sustainable and appropriate technology for water and sanitation in developing communities.

Membership in Professional Organizations

Society of Petroleum Engineers, American Society for Microbiology, American Chemical Society, Geochemical Society, Association of Environmental Engineering and Science Professors, National Society of Professional Engineers (Registered EIT), American Academy for the Advancement of Science, Engineers without Borders

Honors and Awards

2016 U.S. Department of Energy, Oak Ridge Institute for Science and Education (ORISE), Faculty Research Participation Program.

2014 Best Feature Article (Runner-up) in *Environmental Science & Technology* for "Regional variation in water-related impacts of shale gas development and implications for emerging international plays"

2012 Best Feature Article in *Environmental Science & Technology* for "Transformations of Nanomaterials in the Environment"

2008 Ralph E. Powe Junior Faculty Award, Department of Energy, ORAU.

2003 Faculty of 1000 Recommended Paper for "Graphite electrodes as electron donors for anaerobic respiration", Gregory K.B., Bond D.R., Lovley D.R. *Environ*. *Microbiol*. 2004 June 6(6):596-604.

1999 - 2000 NIH Training Grant Fellowship "Biocatalysis and Bioprocessing"

1997 - 1999 NSF Training Grant Fellowship "Gene Expression and Bioremediation"

1998 - 1999 Neil B. Fisher Environmental Engineering Fellowship

Publications - Journal Articles

1. McGivney, E.M., Jones, K.E., Weber, B., Valentine, A.M., VanBriesen, J.M., Gregory, K.B. (2018) Quorum Sensing Signals For Complexes with Ag+ and Cu^{2+} Cations. ACS Chemical Biology.

2. McGivney, E.M. Han, L., Avellan, A., VanBriesen, J.M., Gregory, K.B. (2017) Disruption of Autolysis in Bacillus subtilis using TiO_2 Nanoparticles. *Nature: Scientific Reports* 7, Article number: 44308.

3. Moore, J.D., Avellan, A., Noack, C.W., Guo, Y., Lowry, G.V., Gregory, K.B. (2017) Time-dependent bacterial transcriptional response to CuO nanoparticles differs from that of Cu^{2+} and provides insights into CuO nanoparticle toxicity mechanisms. Environmental Science: Nano 4 (12) 2321-2335.

4. Xu, Y., Gregory, K.B., VanBreisen, J.M. (2016) Microbial-Catalyzed Reductive Dechlorination of Polychlorinated Biphenyls in Hudson and Grasse River Sediment Microcosms: Determination of Dechlorination Preferences and Identification of Rare Ortho Removal Pathways. *Environmental Science & Technology* 50(23), 12767-12778.

5. Vencalek, B.E., Laughton, S.N., Spielman-Sun, E.R., Rodrigues, S.M., Unrine, J.M., Lowry, G.V., Gregory, K.B. (2016). In situ measurement of CuO and $Cu(OH)_2$ nanoparticle dissolution rates in quiescent freshwater mesocosms. *Environmental Science & Technology Letters* 3(10), 375-380.

6. Louie, S.M., Gorham, J.M., McGivney, E.A., Liu, J., Gregory, K.B., Hackley, V.A. (2016) Photochemical transformations of thiolated polyethylene glycol coatings on gold nanoparticles. *Environmental Science: Nano* 3(5), 1090-1102.

7. Gulliver, D.M., Lowry, G.V., Gregory, K.B. (2016) Comparative study of the effects of CO2 concentration and pH on microbial communities from a saline aquifer, a depleted oil reservoir, and a freshwater aquifer. *Environmental Engineering Science* 33(10). 806-816.

8. Moore, J.M., Stegemeier, J.P., Bibby, K., Marianakos, S.M., Lowry, G.V., Gregory, K.B. (2016) Impacts of Pristine and Transformed Ag and Cu Engineered Nanomaterials on Surficial Sediment Microbial Communities Appear Short-Lived. *Environmental Science & Technology* 50(5), 2641-2651.

9. Karthikeyan, K.G., Han, L., Gregory, K.B. (2015) Energy Consumption and Recovery in Capacitive Deionization Using Nanoporous Activated Carbon Electrodes. *Journal of the Electrochemical Society* 162(12), E282-E288.

10. Murali Mohan, A. and Gregory, K.B. (2015) Current Perspective on Produced Water Management Challenges During Hydraulic Fracturing for Oil and Gas Recovery. *Environmental Chemistry* 12(3) 261-266.

11. Unrine, J., Gregory, K.B., Batley, G. (2015) Foreword to 'Fracking: Environmental Challenges and Solutions for Unconventional Oil and Gas Development' Research Front. *Environmental Chemistry* 12(3) pg i.

12. Sanchez, D., Vidic, R.D., Jacobs, D., Gregory, K.B., Huang, J., Hu, Y., Yun, M. (2015) Changes in Carbon Electrode Morphology Affect Microbial Fuel Cell Performance with Shewanella oneidensis MR-1. *Energies* 8, 1817-1829.

13. Gulliver, D., Lowry, G.V., Gregory, K.B. (2014) Effect of CO2(aq) Exposure on a Freshwater Aquifer Microbial Community from Simulated Geologic Carbon Storage Leakage. *Environmental Science & Technology Letters* 1(12), 479–483. DOI: 10.1021/ez500337v

14. Gaspar, J., Mathieu, J., Yang, Y., Tomson, R., Diouma-Leyris, J., Gregory, K.B., Alvarez, P.J.J. (2014) Microbial Dynamics and Control in Shale Gas Production. *Environmental Science & Technology Letters* 1(11), 465-473.

15. Han, L., Karthikeyan, K.G., Anderson, M.A., Gregory, K.B. (2014) Exploring the Impact of Pore Size Distribution on the Performance of Carbonaceous Electrodes for Capacitive Deionization. *Journal of Colloid and Interface Science* 430, 93-99. DOI: 10.1016/j.jcis.2014.05.015

16. Murali Mohan, A., Bibby, K.J., Hammack, R.W., Gregory, K.B. (2014) The Functional Potential of Microbial Communities in Hydraulic Fracturing Source Water and Produced Water from Natural Gas Extraction Characterized by Metagenomic Sequencing. *PLOSone* 9(10) DOI: 10.1371/journal.pone.0107682

17. Gulliver, D., Lowry, G.V., Gregory, K.B. (2014) CO_2 concentration and pH alters subsurface microbial ecology at reservoir temperature and pressure. *RSC Advances* 4, 17443-17453.

18. daSilva, M.L.B., Mezzarri, M.P., Ibelli, A.M.G., Gregory, K.B. (2014) Sulfide removal from livestock biogas by *Azospirillum*-like anaerobic phototrophic bacteria consortium. *International Biodeterioration & Biodegradation*: 86 248-251.

19. Zhang, T., Gregory, K.B., Hammack, R., Vidic, R.D. (2014) Co-precipitation of Radium with Barium and Strontium Sulfate and its Impact on the Fate of Radium during Treatment of Produced Water from Unconventional Gas Extraction. *Environmental Science & Technology* 48(8), 4596−4603.

20. Mauter, M.S., Alvarez, P.J.J., Burton, A., Cafaro, D.C., Chen, W., Gregory, K.B., Jiang, G., Li, Q., Pittock, J., Reible, D., Schnoor, J.L. (2014) Regional Variation in Water-Related Impacts of Shale Gas Development and Implications for Emerging International Plays. *Environmental Science & Technology* 48(15) 8298–8306.

21. Bibby, K.J., Brantley, S.L., Reible, D.D., Linden, K.G., Mouser, P.J., Gregory, K.B., Ellis, B.R., Vidic, R.D. (2013) Suggested Reporting Parameters for Investigations of Wastewater from Unconventional Shale Gas Extraction. *Environmental Science & Technology* 47 (23), pp 13220–13221

22. Murali Mohan, A., Hartsock, A., Bibby, K.J., Hammack, R.W., Vidic, R.D., Gregory, K.B. (2013) Microbial Community Changes in Hydraulic Fracturing Fluids and Produced Water from Shale Gas Extraction. *Environmental Science & Technology* (47) 13141−13150.

23. Murali Mohan, A., Hartsock, A., Hammack, R.W., Vidic, R.D., Gregory, K.B. (2013) Microbial communities in flowback water impoundments from hydraulic fracturing for recovery of shale gas. *FEMS Microbial Ecology* (86) 567-580.

24. Sun, M., Lowry, G.V., Gregory, K.B. (2013) Selective oxidation of bromide in wastewater brines from hydraulic fracturing. *Water Research* 47(11), pp 3723-3731

25. Barbot, E., Vidic, N., Gregory, K.B., Vidic, R.D. (2013) Spatial and Temporal Correlation of Water Quality Parameters of Produced Waters from Devonian-Age

Shale following Hydraulic Fracturing. *Environmental Science & Technology 47 (6), pp 2562–2569*

26. Han, L., Karthikeyan, K.G., Anderson, M.A., Wouters, J.J., Gregory, K.B. (2013) Mechanistic insights into the use of oxide nanoparticles coated asymmetric electrodes for capacitive deionization. *Electrochimica Acta* 90 pp 573-581.

27. Sun, M., Reible, D.D., Lowry, G.V., Gregory, K.B. (2013) Effect of applied voltage, initial concentration and natural organic matter on sequential reduction/oxidation of nitrobenzene by graphite electrodes. *Environmental Science & Technology* 46(11) 6174-6181.

28. Lowry, G.V., Gregory, K.B., Apte, S.C., Lead, J.R. (2012) Transformations of Nanomaterials in the Environment. *Environmental Science & Technology* 46 (13) 6893−6899.

29. Lowry, G.V., Gregory, K.B., Apte, S.C., Lead, J.R. (2012) Guest Comment: Transformations of Nanomaterials in the Environment Focus Issue. *Environmental Science & Technology* 46 (13) 6891-6892.

30. Xu, Y., Yu, Y., Minkley, E.G., Gregory, K.B., VanBriesen, J.M. (2012) Comprehensive Assessment of PCB-contaminated Sediments with Depth: Bacterial Communities and Congener-Specific Analyses. *Journal of Environmental Engineering* 138 (12) 1167-1178.

31. Reinsch, B.C., CM Levard, Z. Li, R. Ma, A. Wise, K.B. Gregory, G.E. Brown, Jr., and G.V. Lowry (2012) Sulfidation of Silver Nanoparticles decreases *Escherichia coli* growth inhibition. *Environmental Science & Technology* 46 (13) 6992–7000.

32. Li, Z., Zhang, Y., LeDuc, P.R., Gregory, K.B. (2011) "Microbial Electricity Generation via Microfluidic Flow Control", *Biotechnology and Bioengineering* 108 (9), 2061-2069.

33. Gregory, K.B., Vidic, R.D., Dzombak, D.A. (2011) "Water Management Challenges in Development of Shale Gas With Hydraulic Fracturing", *Elements* 7, 181–186.

34. Sun, M., Yan, F., Zhang, Ruiling, Reible, D.R., Lowry, G.V., Gregory, K.B. (2010) Redox Control and Hydrogen Production in Sediment Caps Using Carbon Cloth Electrodes *Environmental Science & Technology* 44 (21), 8209–8215.

35. Kirschling, T.L., Golas, P.L., Tilton, R.D., Gregory, K.B., Lowry, G.V. (2010) Bioavailability of polymer nanoparticle coatings. *Geochimica et Cosmochimica Acta* 74(12) ppA520.

36. Xiu, Z., Gregory, K.B., Lowry, G.V., Alvarez, P.J.J. (2010) Effect of bare and coated nano-scale zero-valent iron on *tceA* and *vcrA* gene expression in *Dehalococcoides* spp. *Environmental Science & Technology* 44 (19), 7647-7651.

37. Li, Z., Greden, K., Alvarez, P.J.J., Gregory, K.B., Lowry, G.V. (2010) Adsorbed Polymer and NOM Limits Adhesion and Toxicity of Nano Scale Zerovalent Iron to E. coli. *Environmental Science & Technology* 44 (9), pp 3462–3467.

38. Kirschling, T.L., Gregory, K.B., Minkley, E.G., Lowry, G.V., Tilton, R.D. (2010) Impact of Nanoscale Zero Valent Iron on Geochemistry and Microbial Populations in Trichloroethylene Contaminated Aquifer Materials. *Environmental Science & Technology* 44 (9): 3474–3480.

39. Lanthier, M., Gregory, K.B., and Lovley, D.R. (2008) Growth with high planktonic biomass in Shewanella oneidensis fuel cells. *FEMS Microbiology Letters* 278(1): 29–35.

40. Gregory, K.B. and Lovley, D.R. (2005) Remediation and Recovery of Uranium from Contaminated Subsurface Environments with Electrodes. *Environmental Science & Technology* 38(22): 8943-8947.

41. Williams, A.G.B.*, Gregory, K.B.*, Parkin, G.F. and Scherer, M.M. (2005) RDX transformation by biologically reduced ferrihydrite: Evolution of Fe mineralogy, surface area, and reaction rates. *Environmental Science & Technology* 39(14) 5183-5189.

42. Gregory, K.B., Bond, D.R., and Lovley, D.R. (2004) Graphite electrodes as electron donors for anaerobic respiration. *Environmental Microbiology* 6(6):596-604.

43. Gregory, K.B., Larese-Casanova, P., Parkin, G.F. and Scherer, M.M. (2004) Abiotic Transformation of Hexahydro-1,3,5-trinitro-1,3,5-triazine by FeII Bound to Magnetite. *Environmental Science & Technology* 38(5): 1408-1414.

44. Gregory, K.B., Mason, M.G., Picken, H.D., Weathers, L.J. and Parkin, G.F. (2000) Bioaugmentation of Fe(0) for the Remediation of Chlorinated Aliphatic Hydrocarbons. *Environmental Engineering Science* 17 (3): 169-181.

*authors contributed equally

Publications - Other

1. Dauson, E.R., Gregory, K.B., Greve, D.W., Healy, G.P.m Oppenheim, I.J. (2016) Mechanically robust microfluidics and bulk wave acoustics to sort microparticles. Proc. SPIE 9805, Health Monitoring of Structural and Biological Systems 2016, 98051I (April 1, 2016); doi:10.1117/12.2214394.

2. Dauson, E.R., Gregory, K.B., Oppenheim, I.J., Healy, G., Greve, D.W. (2015) Particle separation using bulk acoustic waves in a tilted angle microfluidic channel. IEEE International Ultrasonics Symposium. 10.1109/ULTSYM.2015.0209

3. Gregory, K.B. (2015) Microbial Ecology of Hydraulic Fracturing. National Academies Press *The Bridge*, Spring 2015, 43-48.

4. Gregory, K.B. (2014) Microbial Ecology of Hydraulic Fracturing. In *Frontiers of Engineering: Reports on Leading-Edge Engineering from the 2014 Symposium*. The National Academies Press, Washington DC. ISBN: 978-0-309-31461-9

5. Dauson, E.R., Oppenheim, I.J., Gregory, K.B., Greve, D.W. (2014) Microparticle separation using a PMMA channel at an oblique angle to a SAW field. IEEE International Ultrasonics Symposium. DOI: 10.1109/ULTSYM.2014.0485

6. Dauson, E.R., Gregory, K.B., Greve, D.W., Oppenheim, I.J. (2014) Surface acoustic wave action on microfluidic channels and microparticles. In SPIE Proceedings Vol. 9061: Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems. DOI: 10.1117/12.2045556

7. Oppenheim, I.J., Dauson, E.R., Greve, D.W., Gregory, K.B. (2013) Microparticle Transport and Concentration with Surface Acoustic Waves. SPIE Smart Structures/NDE Conference Issue 8692-44. DOI: 10.1117/12.2008936

8. Greve, D.W., Wu, W., Oppenheim, I.J., Gregory, K.B. (2012) Particle concentration by acoustic standing waves. *IEEE International Ultrasonics Symposium*. DOI: 10.1109/ULTSYM.2012.0520.

9. Vidic, R.W. and Gregory, K.B. (2011, Spring) Environmental Challenges of Water Management Options. Pittsburgh Engineer, Focus issue on development of the Marcellus Shale. Engineering Society of Western Pennsylvania, Pittsburgh, PA.

10. Gregory, K.B. and Holmes, D.E. (2011) In *Microbial Metal and Metalloid Metabolism: Advances and Applications,* John F. Stolz and Ronald S. Oremland (eds.) American Society for Microbiology Press, Washington DC.

11. Xu, Y., Yu, Y., Gregory, K.B., VanBriesen, J. (2009) "Comparison of Bacterial Populations Related to PCB Microbial Biodegradation in PCB-contaminated Rivers," The Tenth International Symposium on In Situ and On-Site Bioremediation held by Battelle. Baltimore, Maryland, USA. May 5-8, 2009.

12. Xu, Y., Yu, Y., Gregory, K.B., VanBriesen, J. (2009) "Bacterial Communities Analysis with Q-PCR and DGGE in PCB-contaminated Sediment Core," The Fifth International Conference on Remediation of Contaminated Sediments held by Battelle. Jacksonville, Florida, USA. February 2-5, 2009.

13. Gregory K.B., Bond D.R., Lovley D.R. (2004) "Electrodes as electron donors for respiration and bioremediation". Abstracts of Papers of the American Chemical Society 228: U638-U639 294-ENVR Part 1, AUG 22 2004.

14. Scherer M.M., Larese-Casanova P., Gregory K.B., Parkin G.F. (2003) "Fate of RDX in the presence of reduced Fe oxides". Abstracts of Papers of the American Chemical Society 225: U803-U803 43 Part 1, MAR 2003.

15. Gregory K.B., Williams A.G.B., Parkin G.F., Scherer M.M. (2003) "Transformation of RDX by biologically produced ferrous iron species" Abstracts of Papers of the American Chemical Society 226: U592-U592 063-GEOC Part 1, SEP 2003.

16. Gregory, K.B., von Arb, M., Alvarez, P.J.J., Scherer, M.M. and Parkin, G.F. "Biogeochemical Removal of RDX Using Iron Oxide and *Geobacter Metallireducens* GS-15. Bioremediation of Energetics, Phenolics, and Polycyclic Aromatic Hydrocarbons. pp. 1-8. Eds. Victor S. Magar, Glenn Johnson, Say Kee Ong, and Andrea Leeson. The Sixth International In Situ and On-Site Bioremediation Symposium. San Diego, CA. June 4-7, 2001.

17. Gregory, K.B. Oh, B-T, Scherer, M.M., Parkin, G.F. and Alvarez, P.J.J "Biogeochemical Degradation of Redox-Sensitive Compounds Using Iron Oxide and *Geobacter metallireducens* GS-15. Preprints of Extended Abstracts, Division of Environmental Chemistry, V 40, No 2, 220th ACS National Meeting, Washington, D.C. August 20-25, 2000.

18. Alvarez, P.J.J., Sawvel, E., Wildman, M., Eberle, K., Gregory, K.B., Parkin, G.F. and Schnoor, J.L. "Biogeochemical Interactions in Reactive Zero-Valent Iron Barriers" *Bioremediation Research Program Review*, U.S. Environmental Protection Agency Document: EPA/600/R-99/092 (1999).

Invited Presentations and Seminars

1. Gregory, Kelvin B (2016) Microbial Ecology and Biogeochemistry of Produced Water from Hydraulic Fracturing. Petroleum Engineering, Universidad de los Andes. Bogota, Colombia. July 8, 2016.

2. Gregory, Kelvin B (2016) Engineers Without Borders @ Carnegie Mellon University. Engineers Without Borders International Summit. Denver, CO. March 19, 2016.

3. Gregory, Kelvin B (2016) Environmental Engineering Biogeochemistry: Applied Microbiology for Oil and Gas Wastewaters and Healthcare Nanotechnology. Biology Duquesne University. February 19, 2016.

4. Gregory, Kelvin B (2015) Disruption of Population-wide Regulatory Mechanisms and Communication in Bacteria by Engineered Nanomaterials. Sustainable Nanotechnology Organization 2015 Conference. Portland, OR. November 8-11, 2015.

5. Gregory, Kelvin B (2015) Management of Microbial Communities in Produced Water: Data-Driven Opportunities. 2015 NSF Hydraulic Fracturing Workshop. University of Arkansas, Little Rock, AK. April 20-21, 2015.

6. Gregory, Kelvin B (2015) Dynamic microbial communities in hydraulic fracturing water: Implications for chemistry and water management. American Chemical Society 249th National Meeting. Denver, CO. March 22-26, 2015.

7. Gregory, Kelvin B (2015) Microbial Populations in Hydraulic Fracturing Water: the Good, the Bad, and the Ugly for Recycling of Produced Water for Hydraulic Fracturing. US Geological Survey, Reston, VA. January 15, 2015.

8. Gregory, Kelvin B (2014) Water Management for Enhanced Sustainability and Economics of Shale Gas Development. National Academy of Sciences - Arab American Frontiers. Muscat Oman. December 12, 2014.

9. Gregory, Kelvin B (2014) Appropriate Design in Developing Communities: Unintended Impacts from What You Don't Know You Don't Know. Engineers Without Borders Annual Tri-Chapter Meeting. Pittsburgh, PA. November 11, 2014

10. Gregory, Kelvin B (2014) Unconventional Oil and Gas Development; the Good, the Bad, and the Ugly of Recycling Produced Water for Hydraulic Fracturing. University of California-Berkeley. October 31, 2014.

11. Gregory, Kelvin B (2014) Microbial Ecology of Hydraulic Fracturing: Implications for Sustainable Resource Development. National Academy of Engineering – Frontiers of Engineering. Irvine, CA. September 11, 2014.

12. Gregory, Kelvin B (2014) Evolving Microbial Communities in Produced Water from Hydraulic Fracturing: Implications for Produced water Management. American Chemical Society Central Meeting. Pittsburgh, PA. October 30, 2014.

13. Gregory, Kelvin B (2014) Energy-Water Nexus: Hydraulic Fracturing for Oil and Gas. US Department of State, Foreign Service Officers Coal and Power Training Course. Pittsburgh PA. July 18, 2014.

14. Gregory, Kelvin B (2014) Produced Water Management: Microbial Communities and Biogeochemistry. DoE National Energy Technology Laboratory. Pittsburgh, PA. June 19, 2014.

15. Gregory, Kelvin B, Arvind Murali Mohan, Kyle J Bibby (2014) Ecological changes in bacterial communities in water from hydraulic fracturing and production phases of natural gas development from the Marcellus play. American Chemical Society 247th National Meeting & Exposition. March 17, 2014. Dallas, TX.

16. Gregory, Kelvin B (2014) Produced water management challenges during hydraulic fracturing: Microbial ecology and geochemistry. American Chemical Society 247th National Meeting & Exposition. March 16, 2014. Dallas, TX.

17. Gregory, Kelvin B. (2013) Management of Produce Water from Hydraulic Fracturing : Evolving Microbial Communities and Biogeochemistry. University of Pittsburgh, Department of Geology and Planetary Science. January 23, 2014

18. Gregory, Kelvin B (2013) Water Management Challenges, Microbiology and Geochemistry of Produced Water from Hydraulic Fracturing. The Association for Environmental Health & Sciences Foundation 29th Annual International Conference on Soils, Sediments, Water, and Energy. October 22-25, 2013. Amherst, MA.

19. Gregory, Kelvin B (2013) Evolving Microbial Ecology in Produced Water From Hydraulic Fracturing. Duke University, Department of Civil & Environmental Engineering. October 18, 2013.

20. Gregory, Kelvin B (2013) Evolving Microbial Ecology in Produced Water From Hydraulic Fracturing. Council for Chemical Research NIChE, Chemistry and Engineering Research in the Age of Shale Gas. October 2-3, 2013. Pittsburgh, PA.

21. Gregory, Kelvin B (2013) Produced Water Management Challenges during Hydraulic Fracturing: Wellhead and Impoundment Geochemistry and Microbial Ecology. September 23, 2013. Nankai University. Tianjin, CHINA.

22. Gregory, Kelvin B (2013) Overview of Hydraulic Fracturing for Shale Oil and Natural Gas Development. The 7th International Conference on Environmental Chemistry, Workshop on Science and Technology to Enable Treatment and Reuse of Shale Water September 22-27, 2013. Guiyang, China.

23. Gregory, Kelvin B (2013) Microbial Communities and Niches in Shale Water. The 7th International Conference on Environmental Chemistry, Workshop on Science

and Technology to Enable Treatment and Reuse of Shale Water September 22-27, 2013. Guiyang, China.

24. Gregory, Kelvin B. (2013) Produced Water Management: Importance of Microbial Ecology for the Fate of Naturally Occurring Radionuclides. ECI Overcoming the Technical and Community Challenges of Hydraulic Fracturing for Shale Gas. August 4-8, 2013. Boulder, CO

25. Gregory, Kelvin B. (2013) Water Management and Treatment Hurdles. University of Pittsburgh, Energy Law and Policy Institute. August 2 2013. Pittsburgh, PA.

26. Gregory, Kelvin B., Arvind Murali Mohan, Radisav Vidic (2013) Effect of Impoundment Management Strategies on Microbial Communities and the Fate of Radionuclides . American Association of Petroleum Geologists, Annual Conference and Exhibition, May 19-22, 2013. Pittsburgh, PA.

27. Development of Black Shale Gas and Oil Resources in the Marcellus Region: Histrionics and Environmental Microbiology. University of Texas Austin, Civil & Environmental Engineering Seminar. March 21, 2013.

28. Importance of Microbial Communities During Flowback Water Management from Hydraulic Fracturing. Environment & Water Resources Institute Panel on Sustainability of Shale Gas. January 24, 2013.

29. Advancing Environmental and Biotechnology using Electrodes: CDI and Bromide Removal from Oil and Gas Brines. DeNora Industries 1st Annual Research Symposia. November 14, 2012.

30. Importance of Microbial Communities During Flowback Water Management from Hydraulic Fracturing. Carnegie Mellon University. September 1, 2012.

31. Development of Black Shale Gas and Oil Resources: Water Management Challenges and Microbiology. Gordon Research Conference on Environmental Sciences, Water: Grand Challenge Frontiers in the Aquatic Environmental Sciences. The Holderness School, NH. June 24-29, 2012.

32. Flowback Water Management: Biogeochemistry of Radionuclides and other Metals. The Ohio State University. May 24-25, 2012.

33. Bacterial Respiration in Electrochemical Cells for Renewable Energy and Micron-scale Sensing. International Conference on Re-Newable Energy, Baru Sahib, India. May 5-6, 2012.

34. Navigating Diverse Water Management Challenges During Hydraulic Fracturing of Shale for Fossil Energy Production. Universidad de los Andes, Department of Civil and Environmental Engineering. Bogota, Colombia. January 2012.

35. Navigating the Water Management Challenges During Hydraulic Fracturing for Shale Gas Production. NSF Workshop Environmental and Social Implications of Hydraulic Fracturing and Gas Drilling in the United States: An Integrative Workshop for the Evaluation of the State of Science and Policy. Duke University. Durham, NC. January 2012.

36. A Little Help? TEDxPittsburgh. Nemacolin Resort. Farmington, PA. November 2011.

37. Sustainable Marcellus Shale Development? Yes We Can! Carnegie Mellon University: Ceilidh Weekend. Pittsburgh, PA. October 2011.

38. Demonstration of nanoparticle-bound polymer biodegradation and resulting nanoparticle destabilization. American Institute of Chemical Engineering Annual Meeting. Minneapolis, MN. October 2011.

39. Addressing Diverse Water Management Challenges During hydraulic Fracturing of Shale for Natural Gas Production. Keynote Talk. Geological Society of America Annual Meeting. Minneapolis, MN. October 2011.

40. Surface Modifications of Engineered Nanoparticles and their Impacts on Cytotoxicity. Goldschmidt 2011. Prague, Czech Republic. August 2011.

41. Effect of engineered and natural surface modification of nanoparticles on their interactions with bacteria. International Conference on the Environmental Implications of NanoTechnology, ICEIN 2011. Duke University. Durham, NC. May 2011.

42. Hydraulic Fracturing: Process and Water Management. University of Notre Dame, Department of Civil Engineering and Geological Sciences. South Bend, IN. November 2010.

43. Marcellus Shale Development and Water Issues. CMU Qatar Petroleum and Ras Gas Company, Ltd. Pittsburgh, PA. November 2010.

44. Water Management During Hydraulic Fracturing of Marcellus Shale for Natural Gas Production, AiChE/ACS Energy Technology Group. Pittsburgh, PA. November 2010.

45. Sustainable Water Management During Hydraulic Fracturing of Shale for Natural Gas Production. International Conference on Environmental Challenges. Kanya Maha Vidyala, Punjab INDIA. October 15-16, 2010.

46. Water Usage and Management During Hydraulic Fracturing of Shale for Natural Gas Production. Sustainable Engineering Forum, SURF 15- Building Bridges Among Stakeholders. October 2010.

47. Marcellus Shale Gas Development: Process and Water Management. Water QUEST 2010 State of the Monongahela River Research Forum. Pittsburgh, PA. September 2010.

48. Phenomenology Meets Molecular Ecology: Bacterial Respiration in Electrochemical Cells for Renewable Energy and Environmental Restoration. Carnegie Mellon University, Department of Biology. Pittsburgh, PA. April 2010.

49. Impact of Natural and Engineered Coatings on Microbe-Nanoparticle Interactions. 2010 CEINT Internal Scientific Meeting. Durham, NC. April 2010.

50. Engineering polymeric nanoparticle coatings for decreased toxicological impacts of nanoscale zero-valent iron. 239th ACS National Meeting & Exposition. San Francisco, CA. March 21-25, 2010.

51. Electrode-based Remediation of Uranium(VI) from Acidic Subsurfaces. HydroGeoLogic, Inc., Reston, VA. August 2009.

52. Center for the Environmental Implications of Nanotechnology (CEINT): Microbial Interactions with Engineered Nanomaterials. WVNano Research Symposium. West Virginia University, Morgantown, WV. May 2009.

53. Aqueous Geochemical Conditions Affecting Electrode-based Removal of Uranium. 4th Annual Department of Energy ERSP PI Meeting, Washington DC. April 2009.

54. Prokaryote Power: Electrode Technology for Energy and the Environment, Department of Energy, National Energy Technology Laboratory. Pittsburgh, PA. April 2009.

55. Batteries and Bioremediation: Electrode Technology for Energy and the Environment. Environmental Engineering and the Environmental Molecular Science Institute, The Ohio State University, Columbus, OH. January 2009.

56. Case Study in Pine Creek Watershed, Allegheny County, PA: Physical source tracking using molecular microbial methods. Water Environment Federation, Collection Systems 2008 Management Conference. Pittsburgh, PA. May 2008.

57. Prokaryote Power: Environmental Electrodes for Remote Electricity and Remediation, Departmental Seminar, Department of Biological Sciences, Duquesne University, Pittsburgh, PA, November 2007.

58. Bacteria, Batteries, and Bioremediation: Soil microbes for electricity production and environmental restoration, Departmental Lecture Rice University Department of Civil and Environmental Engineering, Houston, TX, October 2006.

59. Microbiology for the Profession of Arms: Energy and the Environment, Department of the Army, U.S. Military Academy, West Point, NY, November 2005.

60. Problem Solving with Applied Microbiology, University of Massachusetts, Department Biological Sciences, Amherst, MA, November 2004.

61. Microbial Respiration for Electricity Harvesting and Bioremediation, BIOTAP Seminar Series University of Massachusetts, Department Biological Sciences, Amherst, MA, April 2004.

62. Bacteria, Batteries and Bioremediation: Soil microbes for electricity production and environmental restoration, Departmental Lecture Hamilton College Department of Biology, Clinton, NY, March 2004.

63. Electrodes as Electron Acceptors and Donors for Microbial Respiration During Electricity Harvesting and Bioremediation, Departmental Lecture University of Massachusetts Department of Civil and Environmental Engineering, Amherst, MA, April 2003.

64. Biological and Biogeochemical Degradation of RDX using *Geobacter metallireducens* GS-15, 9th Annual Biocatalysis and Bioprocessing Conference, University of Iowa, Iowa City, IA, October 2000.

Other Presentations

1. Moore, J.D., Bertuccio, A., Avellan, A., Tilton, R.D., Lowry, G.V., Gregory, K.B. (2016) Antimicrobial effects of Cu-based engineered nanomaterials in environmental and engineered systems. Sustainable Nanotechnology Organization Conference. Orlando, FL. November 11, 2016.

2. McGivney, E., VanBriesen, J.M., Gregory, K.B. (2016) Impacts of nanoparticles on population-level behavior in bacteria: quorum sensing and autolysis. American Chemical Society National Meeting. Philadelphia, PA. August 24, 2016.

3. Moore, J.D., Bertuccio, A., Tilton, R.D., Lowry, G.V., Gregory, K.B. (2016) Differentiating Cu2+ and CuO nanoparticulate antimicrobial effects in engineered

and environmental systems. American Chemical Society National Meeting. Philadelphia, PA. August 23, 2016.

4. Gregory, K.B. Han, L., McGivney, E.M. (2015) Disruption of critical growth and communication signals in bacteria: Nanoparticles that rescue cell populations. Pacifichem. Honolulu, HI. December 14-19, 2015.

5. Gregory, Kelvin B., Moore, Joe E., Lowry, Greg V., Bibby, Kyle J., Stegemeier, J. (2015) Impacts of pristine and transformed Ag and Cu nanomaterials on freshwater microbial communities. 10th International Conference on the Environmental Effects of Nanoparticles and Nanomaterials. Vienna, Austria. September 4-10, 2015.

6. Gregory, Kelvin B, Jeanne VanBriesen, Eric McGivney (2015) Disruption of quorum sensing by adsorption of acyl-homoserine lactone to engineered nanomaterials. American Chemical Society 249th National Meeting. Denver, CO. March 22-26, 2015.

7. Erin R. Dauson, Irving J. Oppenheim, Kelvin B. Gregory, David W. Greve (2014) Microparticle separation using a PMMA channel at an oblique angle to a SAW field. IEEE International Ultrasonics Symposium. September 3-6, 2104 Chicago, IL.

8. Lowry, Gregory V, Thanasis Karamalidis, Aniela Burant, Djuna Gulliver, Kelvin B. Gregory (2014) Carbon sequestration in the United States: Using biogeochemistry to improve our understanding of the environmental risk. 5th EUCheMS. Istanbul, Turkey. September 3, 2014.

9. Eric McGivney, Linchen Han, Kelvin B. Gregory (2014) Disruption of Autolytic Cell Response and Other Cell-to-cell Communications in Bacteria by Engineered Nanomaterials. ASCE Sustainability Conference. March 27, 2014. Pittsburgh, PA.

10. Joe D. Moore, Gregory V. Lowry, Kelvin B. Gregory (2014) Microbial community and metagenomic impacts of pristine and transformed inorganic nanoparticles in wetland mesocosms. Duquesne University Pittsburgh Bacterial Meeting. March 8, 2014. Pittsburgh, PA.

11. Eric McGivney, Linchen Han, Kelvin B. Gregory (2014) Disruption of Autolytic Cell Response and Other Cell-to-cell Communications in Bacteria by Engineered Nanomaterials. Duquesne University Pittsburgh Bacterial Meeting. March 8, 2014. Pittsburgh, PA.

12. Erin R. Dauson, Kelvin B. Gregory, David W. Greve, Irving J. Oppenheim (2014) Surface acoustic wave action on microfluidic channels and microparticles. SPIE Smart Structures NDE. March 9-13, 2014. San Diego, CA.

13. Gregory, Kelvin B, Arvind Murali Mohan, Radisav Vidic (2013) Microbial communities and the fate of uranium in simulated produced water impoundments from hydraulic fracturing. American Chemical Society (ACS), National Meeting and Exposition. September 8-12, 2013. Indianapolis, IN.

14. Gregory, Kelvin B, Arvind Murali Mohan, Radisav Vidic (2013) Microbial Ecology and Radionuclides in Flowback and Produced Water from Hydraulic Fracturing of the Marcellus Shale. Association of Environmental Engineering and Science Professors, Research and Education Conference. July 14 - 16, 2013. Golden Colorado

15. Kelvin B. Gregory, Arvind Murali Mohan, Radisav. D. Vidic. Effect of Impoundment Management Strategies on Microbial Communities and the Fate of Radionuclides. American Association of Petroleum Geologists Annual Convention and Exhibition. May 19-22, 2013. Pittsburgh, PA.

16. David W. Greve, Wei Wu, Irving J. Oppenheim, Kelvin B. Gregory, 'Particle concentration by acoustic standing waves'. IEEE International Ultrasonics Symposium. October 2012, Dresden Germany.

17. Arvind Murali Mohan, Angela Hartsock, Richard W. Hammack, Radisav D. Vidic, Kelvin B. Gregory, ' Microbial Ecology and Geochemistry of Flowback and Produced Water from Hydraulic Fracturing for Gas Production from the Marcellus Shale', (Talk), American Institute of Chemical Engineers, Pittsburgh, PA, Oct 28- Nov 2, 2012.

18. Arvind Murali Mohan, Angela Hartsock, Richard W. Hammack, Radisav D. Vidic, Kelvin B. Gregory, ' Microbial ecology and geochemistry of hydraulic fracturing fluid and flowback water from Devonian-aged shale', (Talk), American Chemical Society National Meeting, Philadelphia, PA, August 19-23, 2012.

19. Arvind Murali Mohan, Angela Hartsock, Richard W. Hammack, Radisav D. Vidic, Kelvin B. Gregory. Microbial Community Changes with Time in Flowback Water Produced from Hydraulic Fracturing of Devonian Black Shale for Natural Gas Production. American Society of Microbiology General Meeting, San Francisco, California June 16-19, 2012.

20. Arvind Murali Mohan, Angela Hartsock, Richard W. Hammack, Radisav D.Vidic and Kelvin B. Gregory, 'Microbial Ecology and Geochemistry of Hydraulic Fracturing Fluid and Flowback Water from Devonian-aged Shale', (Poster), Environmental Research and Poster Session organized by Steinbrenner Institute, Pittsburgh, PA, 8 May, 2012.

21. Kelvin B. Gregory, Arvind Murali Mohan, Radisav Vidic, Richard Hammack, Pete Miller. Microbial Communities in Flowback Water Impoundments From Hydraulic Fracturing of Shale for Natural Gas Recovery. Society of Petroleum Engineers, Annual Technical Conference and Exhibition. Denver, CO. October 2011.

22. Kelvin B. Gregory and Linchen Han. Nanoparticles that save bacteria: Disruption of autolysis in *Bacillus subtilis* cultures using TiO2. American Chemical Society 242nd National Meeting. Denver, CO. August 2011.

23. Kelvin B. Gregory, Zhiqiang Li, Gregory V. Lowry. Natural organic matter coatings obstruct cytotoxicity of titanium dioxide nanoparticles by eliminating reactive oxygen species. American Chemical Society 242nd National Meeting. Denver, CO. August 2011.

24. Teresa Kirschling, Patricia Golas, Kelvin Gregory, Jason Lohn, Robert Tilton. Understanding the microbial communities that influence nanoparticle fate and transport via polymer coating degradation. American Chemical Society 242nd National Meeting. Denver, CO. August 2011.

25. Kelvin B. Gregory, Arvind Murali Mohan, Radisav D. Vidic. Microbial Communities in Flowback Water Impoundments from Hydraulic Fracturing of Shale for Natural Gas Recovery. Association of Environmental Engineering and Science Professors Education and Research Conference. Tampa Bay, FL. July 2011.

26. Arvind Murali Mohan and Kelvin B. Gregory, Microbial Diversity in Treated and Untreated Impoundments Receiving Flowback Water from Hydraulic Fracturing of the Marcellus Shale. Penn Tech 2011 organized by Pennsylvania Water Engineers Association, Lancaster, PA, 5-7 June, 2011.

27. Kelvin B. Gregory and Linchen Han. Disruption of autolysis in Bacillus subtilis cultures using titanium dioxide: how nanoparticles can save bacteria. Gordon Research Conference: Environmental Nanotechnology. Waterville Valley Resort, NH. May 2011.

28. Arvind Murali Mohan, Richard W. Hamamck, Radisav D. Vidic and Kelvin B. Gregory, Characterization of Microbial Populations in Flowback Water Impoundments from Hydraulic Fracturing Operations in Pennsylvania. American Institute of Professional Geologists, Pittsburgh, PA. April, 2011.

29. Arvind Murali Mohan, Radisav D. Vidic and Kelvin B. Gregory, Impact of Treatment on Depth-dependent Microbial Communities in Flowback Water Impoundments from Hydraulic Fracturing Operations. Steinbrenner Institute, Environmental Research and Poster Session. Pittsburgh, PA. April, 2011.

30. Kelvin B. Gregory and Juan Peng. Remediation and recovery of uranium and technetium from contaminated groundwater using graphite electrodes. American Chemical Society Pacifichem 2010. Honolulu HI. December 2010.

31. Kelvin B. Gregory, Zhiqiang Li, Linchen Han, Chanil Jung, Greg Lowry. Impact of engineered and natural surface modifications to nanoparticles on their toxic affects towards bacteria. American Chemical Society Pacifichem 2010. Honolulu HI. December 2010.

32. Theresa L Kirschling, Kelvin B. Gregory, Robert D. Tilton, Greg V. Lowry. Microbial Bioavailability of Polyethylene Oxide Grafted to Engineered Nanomaterials. Interagency Nanotechnology Workshop. November 2010.

33. Theresa L Kirschling, Patricia L. Golas, Kelvin B. Gregory, Kristof Matyjaszewski, Edwin G. Minkely, Gregory V. Lowry, Robert D. Tilton. Bioavailability and Microbial Degradation of Nanomaterial Coatings. American Institute of Chemical Engineers 2010 Annual Meeting. Salt Lake City, UT. November 8-10, 2010

34. Theresa L Kirschling, Kelvin B. Gregory, Edwin G. Minkely, Gregory V. Lowry, Robert D. Tilton. Microbial Interactions with Nanoscale Zero Valent Iron. American Institute of Chemical Engineers 2010 Annual Meeting. Salt Lake City, UT. November 8-10, 2010.

35. Theresa L Kirschling, Kelvin B. Gregory, Edwin G. Minkely, Gregory V. Lowry, Robert D. Tilton. Interactions of Zero Valent Iron Nanoparticles with Native Aquifer Microbial Communities and Dehalococcoides Containing Cultures. 13th International Symposium on Microbial Ecology. August 22-27, 2010.

36. Juan Peng and Kelvin B. Gregory. Electrode-based remediation of U(VI)-contaminated acidic subsurfaces. 240th National Meeting of the American Chemical Society. Boston, MA. August 22 – 26, 2010.

37. Zhiqiang Li, Brian Reinsch, Rui Ma, Gregory V. Lowry, Kelvin B. Gregory. Sulfidation eliminates bactericidal effects of silver nanoparticles to Escherichia coli. 240th National Meeting of the American Chemical Society. Boston, MA. August 22 – 26, 2010.

38. Elise Barbot, Meng Li, MaryKate Hendrickson, Juan Peng, Kelvin B. Gregory, Radisav D. Vidic. Use of acid mine drainage in management of flowback water from Marcellus shale hydrofracturing. 240th National Meeting of the American Chemical Society. Boston, MA. August 22 – 26, 2010.

39. Zhiqiang Li, Gregory V. Lowry, Kelvin B. Gregory. NOM and polymeric coatings impact on the bactericidal effects of TiO2 nanoparticles to *Escherichia coli*. American Chemical Society 84th Colloids Symposium. Akron, OH. June 20-23 2010.

40. Theresa L Kirschling, Kelvin B. Gregory, Gregory V. Lowry, Robert D. Tilton. Bioavailability of polymer nanoparticle coatings. Geochemical Society: Goldschmidt 2010. Oak Ridge, TN. June 13-18, 2010.

41. Elise Barbot, Meng Li, MaryKate Hendrickson, Juan Peng, Kelvin B. Gregory, Radisav D. Vidic. Sustainable management of flowback water from the Marcellus shale. AIPG Marcellus Shale: Energy Development & Enhancement by Hydrualic Fracturing. Pittsburgh, PA. May 5-6, 2010.

42. Gregory V. Lowry, Brian Reinsch, Zhiqiang Li, Kelvin B. Gregory. Effect of Sulfidation on Chemical Composition, Persistence, and Bactericidal Properties of Ag NPs. The International Consortium for the Environmental Implications of Nanotechnology (iCEINt). FRANCE. May 2010.

43. Theresa L Kirschling, Patricia L. Golas, Kelvin B. Gregory, Robert D. Tilton. Gregory V. Lowry. Bioavailability of Polymer Nanoparticle Coatings. International Conference on the Environmental Implications of Nanomaterials. Los Angeles, CA. May 11 - 13, 2010.

44. Zhiqiang Li, Gregory V. Lowry, Kelvin B. Gregory. Polymeric coatings impact on the cytotoxicity of TiO2 nanoparticles to *Escherichia coli*. 2010 CEINT Internal Scientific Meeting. Durham NC. April 2010.

45. Juan Peng, Kelvin B. Gregory. Electrode-Induced Recovery of Uranium(VI) from Acidic Subsurfaces. US Department of Energy Subsurface Biogeochemical Research Annual Meeting. Washington DC, March 29-31, 2010.

46. Kelvin B. Gregory. Engineering polymeric nanoparticle coatings for decreased toxicological impacts of nanoscale zero-valent iron. 239th National Meeting of the American Chemical Society. San Francisco, March 21–25, 2010.

47. Juan Peng and Kelvin B. Gregory. Geochemical Conditions Affecting Electrode-based Removal of Uranium 238th ACS National Meeting & Exposition. Washington, D.C. August 16-20, 2009.
48. Microfluidic Fuel Cells and Environmental Restoration using Microbe-Electrode Technology. University of Texas-Austin. Department of Civil and Environmental Engineering. Austin, TX. October 2009.

49. Zhiqiang Li, Kelvin B. Gregory, and Gregory V. Lowry. Polymeric coatings eliminate the bactericidal effects of Nanoscale zero-valent iron to *Escherichia coli*. 2009 AGU Fall Meeting. San Francisco, CA. December 14-18, 2009.

50. Teresa L. Kirschling, Z. Li, H-J Kim, B.C. Reinsch, K.B. Gregory, E.G. Minkley Jr., C. Kim, P. J.J. Alvarez, R. D. Tilton, G.V. Lowry "The Effect of Surface Coatings on the Environmental and Microbial Fate of Nanoiron and Fe^{3+} Oxide Nanoparticles" Interagency Nanotechnology Workshop, Las Vegas, NV. November 9 – 10, 2009.

51. Teresa L. Kirschling, K.B. Gregory, E.G. Minkley, G. V. Lowry, R.D. Tilton. "The Impact of Reactive Iron Nanoparticles on Microbial Diversity in Aquifer Soils" International Conference on the Environmental Implications of Nanomaterials, Washington, DC. September 9-11, 2009.

52. Zhiqiang Li, Ying Zhang, Philip R. LeDuc, and Kelvin B. Gregory. *Whole-cell Microfluidic Fuel Cells for Self-Powered Amperometric Sensing*. 238th American Chemical Society Fall National Meeting. Washington, D.C. August 16-20, 2009.

53. Zhiqiang Li, Ying Zhang, Philip R. LeDuc, and Kelvin B. Gregory. *Laminar Flow Biological Fuel Cells for Self-powered Amperometric Sensing*. 238th American Chemical Society Fall National Meeting. Washington, D.C. August 16-20, 2009.

54. Juan Peng and Kelvin B. Gregory. *Geochemical Conditions Affecting Electrode-based Removal of Uranium* 238th American Chemical Society Fall National Meeting. Washington, D.C. August 16-20, 2009.

55. Mei Sun, Fei Yan, Danny D. Reible, Gregory V. Lowry, Kelvin B. Gregory. *Electrode-based reactive capping of contaminated sediments for in situ redox control*. 238th American Chemical Society Fall National Meeting. Washington, D.C. August 16-20, 2009.

56. Zhiqiang Li, Karl Greden, Pedro J. J. Alvarez, Gregory V. Lowry and Kelvin B. Gregory. *On the Prevention of Nanomaterial Toxicity Through Stabilization with Organic Particle Surface Coatings*. 2009 AEESP National Meeting. Iowa City, IA. July 26-29, (2009).

57. Zhiqiang Li, Ying Zhang, Philip R. LeDuc, and Kelvin B. Gregory. *Laminar flow based Microfluidic Microbial Fuel Cell: Electricity Production by Bacteria*. 109th General Meeting of the American Society for Microbiology. Philadelphia, PA. May 17-21, (2009).

58. Juan Peng and Kelvin B. Gregory. *Geochemical Conditions Affecting Electrode-based Removal of Uranium*. Department of Energy, Environmental Remediation Science Program 4th Annual PI Meeting. Lansdowne, VA. April 20-23, 2009

59. Zhiqiang Li, Ying Zhang, Philip R. LeDuc, and Kelvin B. Gregory. *Microfluidic Microbial Fuel Cell: a Potential Sustainable Battery for Remote Electronic Devices*. Engineering Sustainability 2009: Innovations that Span Boundaries. Pittsburgh, PA. April 19-21, 2009, (2009).

60. Zhiqiang Li, Ying Zhang, Philip R. LeDuc, and Kelvin B. Gregory. *Whole-cell Microfluidic Fuel Cells for Self-Powered Amperometric Sensing.* 4th Annual Pittsburgh Bacterial Meeting. Pittsburgh, PA Saturday, March 7, (2009).

61. Kelvin B. Gregory and Derek R. Lovley. *Temperature Related Variance of Microbial Communities Associated with Electricity Harvesting Anodes in Marine Sediments*. 106th American Society for Microbiology General Meeting. Orlando, FL May 21-25 (2006).

62. Larrahondo, M.J., R. A. O'Neil, D. E. Holmes, M. V. Coppi, L. A. Adams, J. E. Ward, H. A. Vrionis, K.B. Gregory, A. L. N'Guessan, E. M. Conlon, B. A. Methe, K. P. Nevin, A. Liu, D. R. Lovley. *Characterization of Two Iron-Dependent Repressors Conserved Across the Geobacteraceae*. 106th American Society for Microbiology General Meeting. Orlando, FL May 21-25 (2006).

63. O'Neil, R.A., D. E. Holmes, L. A. Adams, M. J. Larrahando, J. E. Ward, L. N. DiDonato, H. A. Vrionis, K.B. Gregory, A. L. N'Guessan, D. R. Lovley. *Monitoring the In Situ Metabolic State of Geobacter Species During Subsurface Bioremediation*. 106th American Society for Microbiology General Meeting. Orlando, FL May 21-25 (2006).

64. Holmes, D.E., R. A. O'Neil, L. A. Adams, M. J. Larrahando, J. E. Ward, H. A. Vrionis, K. B. Gregory, A. L. N'Guessan, D. R. Lovley. *Genomic Analysis of Uncultivated Geobacteraceae Species Obtained by Single Cell and Direct Environmental Sequencing*. 106th American Society for Microbiology General Meeting. Orlando, FL May 21-25 (2006).

65. Gregory, K.B., Sullivan, S.A. and Lovley, D.R. *Electricity from Swine Waste Coupled with Odor Reduction using Electrodes* 105th American Society for Microbiology General Meeting. Atlanta, GA June 5-9 (2005).

66. Gregory, K.B. and Lovley, D.R. *Electrodes as Electron Donors for Respiration and Bioremediation*. 228th American Chemical Society Meeting. Philadelphia, PA. August 22-27, (2004).

67. Gregory, K.B. and Lovley, D.R. *Electrode Enhanced Bioremediation of Uranium*. 104th American Society for Microbiology General Meeting. New Orleans, LA May 23-27 (2004).

68. Gregory, K.B. Williams, A.G.B., Parkin, G.F. and Scherer, M.M. *Transformations of RDX by Biologically produced ferrous iron species*. 226th ACS National Meeting, Division of Environmental Chemistry. New York, N.Y. September 7-11, (2003).

69. Gregory, K.B., Bond, D.R., Lovley, D.R. *Graphite Electrodes as Electron Donors for Anaerobic Respiration*. 103rd American Society for Microbiology General Meeting. Washington, DC. May 19-23 (2003).

70. Gregory, K.B., Scherer, M.M. and Parkin, G.F. *Biotic and Abiotic Transformations of RDX by Geobacter metallireducens GS-15*. 102nd American Society for Microbiology General Meeting. Salt Lake City, UT. May 19-23 (2002).

71. Gregory, K.B., Scherer, M.M. and Parkin, G.F. *Transformations of RDX by Geobacter metallireducens GS-15 and Iron Oxides*. 10th Biocatalysis and Bioprocessing Conference. Iowa City, IA. October 22-24 (2001).

72. Gregory, K.B., Oh, B-T, Alvarez, P.J.J., Scherer, M.M. and Parkin, G.F. *Biogeochemical Removal of RDX Using Iron Oxides and Geobacter metallireducens GS-15*. In Situ and On Site Bioremediation: The Sixth International Symposium. San Diego, CA June 4-7, (2001).

73. Gregory, K.B. Oh, B-T, Scherer, M.M., Parkin, G.F. and Alvarez, P.J.J *Biogeochemical Degradation of Redox-Sensitive Compounds Using Iron Oxide and Geobacter metallireducens GS-15*. 220th ACS National Meeting, Division of Environmental Chemistry. Washington, D.C. August 20-25, (2000).

74. Gregory, K.B., Holmes, D., and Dawson, S. *Phylogenetic Identification of a Nonthermophilic Member of the Order Thermotogales*. 8th Biocatalysis and Bioprocessing Conference. Iowa City, IA. October 25-27 (1999).

75. Gregory, K.B., Weathers, L.J., Mason, M.M. and Parkin, G.F. *Enhanced Anaerobic Biodegradation of Chlorinated Aliphatic Hydrocarbons Using Elemental Iron*. The First International Conference on Remediation of Chlorinated and Recalcitrant Compounds. Monterey, CA. May 18-21 (1998).

Funded Research (PI)

PMMA Device for Droplet-Based Complete Blood Count. Gregory, K.B., Dahl, K.A., Dauson, E.D. Disruptive Healthcare Technologies Institute $100,000. Sept 2016-August 2017.

CEINT 2 Subproject: Bacterial and Microbial Community Interactions with Nanoparticles. Gregory, K.B. and VanBriesen, J. National Science Foundation $199,862. October 2013 – September 2015.

Impact of Microbially Mediated Precipitation on Flow and Seal properties. Gregory, K.B. and Lowry, G.V. US DoE/NETL-RUA. $42,620, November 2013 – September 2014.
Fate of naturally Occurring Radioactive Material (NORM) in Produced Waters from Shale Gas Development. Gregory, K.B. US DoE/NETL-RUA. $120,000 November 2013-November 2014.

Fate of naturally Occurring Radioactive Material (NORM) in Produced Waters from Shale Gas Development. Gregory, K.B. US DoE/NETL-RUA. $111,600. November 2012-November 2013.

Augmented Surface Acoustic Wave Devices for Microbial Cell Separation on Physiological Properties. Gregory, K.B. and Greve, D.W. National Science Foundation $366,289 September 2012-August 2015.

Fate of Naturally Occurring Radioactive Material (NORM) in Flowback and Produced Waters from Natural Gas Development. Gregory, K.B. US DoE/NETL-RUA. $105,000 November 2011-November 2012.

Impact of Microbially Mediated Precipitation on Flow and Seal properties. Gregory, K.B. and Lowry, G.V. US DoE/NETL-RUA. $42,620 November 2012 – September 2013.

Impact of Microbially Mediated Precipitation on Flow and Seal Properties. Gregory, K.B. and Lowry, G.V. US DoE/NETL-RUA. $40,000 November 2011 – September 2012.

Fate of Naturally Occurring Radioactive Material (NORM) in Flowback and Produced Waters from Natural Gas Development. Gregory, K.B. US DoE/NETL-RUA. $105,000 November 2011-November 2012.

Fate of Naturally Occurring Radioactive Material (NORM) in Flowback and Produced Waters from Natural Gas Development. Gregory, K.B. US DoE/NETL-RUA. $90,000 March 2011-Sept 2011.

Identification of Microbial Processes Affecting Storage, Seal Integrity, and Metals Mobility at Carbon Sequestration Sites. Gregory, K.B. and Lowry, G.V. US DoE/NETL-RUA. $61,426 November 2010 - November 2011.

CEINT Subproject: Macroscopic and particle scale understanding of the effects of adsorbed organic macromolecules on NP-bacteria interactions and toxicity. Gregory, K.B. and VanBriesen, J. $400,000 October 2008 – September 2013.

An Investigation of Microbial Processes in Deep Substrate Carbon Separation. Gregory, K.B. and Lowry, G.V. US DoE/NETL. $53,111 May 2010 – September 2010.

Electrode Induced Removal and Recovery of Uranium (VI) from Acidic Subsurfaces. Gregory, K.B. US DoE-ERSP. $150,000 June 2008 – June 2011.

Funded Research (Co-PI)

Use of Novel Water Treatment Methods for Inland Desalination of Brackish Groundwater. Karthikeyan, K.G. and Gregory, K.B. Qatari National Research Fund. $923,080 September 2011-August 2014. Approved for funding but refused by CMU due to overhead recovery issue.

CO2 Acting as a Solvent: Effects on Rock-Organic Compound Interaction, Biodegradation of Organics, and Bioavailability on the Supercritical. Karamalidis, A., Lowry, G.V., Gregory, K.B. US DoE/NETL-RUA. $281,906 November 2010 – November 2011.

Expanding Public Understanding of Water Quality Impacts from Shale Gas Production in Pennsylvania. VanBriesen, J. and Gregory, K.B. COLCOM Foundation $100,000.

Sustainable Management of Flowback Water during Hydraulic Fracturing of Marcellus Shale for Natural Gas Production. Vidic, R.D. and Gregory, K.B. US DoE-NETL, $1,060,000 October 2009 – September 2012.

The Development of Funnel and Gate Technology for Containment and In-situ Treatment of Contaminated Sediments. Reible, D.D., Hughes, J.B., Lowry, G.V., Gregory, K.B. US NIH- NIEHS $600,000 direct. September 2007-September 2011.

The role of volunteer sampling and source identification in the development of a bacterial TMDL for Pine Creek. VanBriesen, J., Small, M.S., Dzombak, D.A. Three Rivers Wet Weather, Inc. $85,000 January 2007 – May 2008.

Modeling and decision-support tools based on the effects of sediment geochemistry and microbial populations on contaminant reactions in sediment. VanBriesen, J., Lowry, G.V., Small, M.S., Minkley, N., Gregory, K.B., US DoD-SERDP $933,000 April 2006-March 2010.

Courses Taught

Introduction to Civil & Environmental Engineering

Introduction to selected subfields in the discipline, such as structural engineering, construction project management, and environmental engineering. Problem-solving exercises apply fundamental concepts from these subfields to integrate the steps of analysis, synthesis, and evaluation through individual homework assignments and group projects that require attention to a broad range of issues. The course also exposes the students to issues related to engineering practice such as working in teams, scheduling, evaluating risk and making ethical decisions. In addition to regular lectures and project exercises, the course includes guest speakers and class demonstrations.

Fluid Mechanics and Fluid Mechanics Laboratory

This is an introductory level course dealing with the properties and behavior of fluids in civil and environmental engineering applications. The fundamental principles of continuity, energy and momentum are introduced and applied to fluid statics, fluid dynamics, kinematics, pipe flows, open channel flows, similarity laws, fluid loading, and unsteady flows. Students are introduced to the Navier-Stokes equations and CFD. The course provides essential knowledge for the study of natural flow phenomena in rivers, estuaries oceans and the atmosphere. It provides the fundamental theory for understanding and design of engineered channels, spillways, energy dissipators, natural channels and pipe networks. Laboratory experiments are designed to illustrate basic fluid mechanics principles and support the lecture course. Topics covered in the laboratory include: fluid properties: density, specific gravity, viscosity; fluid characteristics; continuity, conservation of energy; fluid behavior: center of pressure, pipe flow, open-channel flow. Laboratory experiments illustrating basic principles.

Environmental Microbiology for Engineers

This class provides a general introduction to microorganisms in natural, engineered, and artificial environments. Selected topics include cellular architecture, energetics and energy conservation, growth and catabolism, evolution and genetics, population and community dynamics, water and soil ecology, biogeochemical cycling, microorganisms in wastewater, pollution attenuation, and bioremediation.

Produced Water Management & Treatment (Universidad de los Andes)

The purpose of this course is to introduce the student to the critical issues that surround the management of produced water from oil and gas development. This course discusses methods, equipment and tools used for testing, diagnosing, and minimizing water production from unconventional oil and gas wells. Reservoir engineering and surface facility aspects of water handling, treatment, re-injection and injection well fracturing are discussed. Emergent technologies that enable re-use of produced water are discussed. The economics of oil and gas production can be significantly improved through enhanced water management through improved handling and disposal, treatment and volume reduction, reuse and re-injection strategies. The course covers the fundamental theory, and the latest technological developments. It particularly emphasizes field application through lots of practical field examples, exercises and case studies.

Reviewer Activities

National Research Council, The Gordon and Betty Moore Foundation, U.S. National Science Foundation, Environmental Science & Technology, Applied & Environmental Microbiology, Langmuir, Environmental Microbiology, Environmental Science & Technology Letters, Biotechnology and Bioengineering, Chemosphere, BioEssays, Biodegradation, Journal of Hazardous Materials, Journal of Environmental Quality, and others.

Organizational Activities in Professional Organizations

Association of Environmental Engineering Science Professors. Chair Government Affairs Committee. (2017-curr)

Science Advisory Board for Association of Environmental Health and Sciences Foundation (2013-2017)

Association of Environmental Engineering Science Professors. Vice-chair Government Affairs Committee. (2014-2017)

Conference Session Chair, Sustainable Nanotechnology Organization, 4th Conference. Portland, OR. Nov 8-11, 2015.

Guest Editor *Environmental Chemistry* Research Focus Issue on Hydraulic Fracturing, to appear in Sumer 2015

Co-organizer; ACS Session on "Environmental Implications and Effects of Unconventional Gas Development" Indianapolis IN, September 2013

Conference Co-Organizer: Engineering Conferences International, "Overcoming the Technical and Community Challenges of Hydraulic Fracturing for Shale Gas" Boulder CO, August 2013

Co-Organizer and Chair: American Association of Environmental Engineering and Science Professors, "Unconventional gas development: what are the key environmental questions?" Golden CO, July 2013

Co-organizer; ACS session on "Environmental Applications and Implications of Nanotechnology" for the Division of Environmental Chemistry at PacificChem, Honolulu HI, December 2010

Guest Editor *Environmental Science & Technology* special issue on "Transformations of Engineered Nanomaterials" in the Environment, July 2012

Co-organizer; Goldschmidt Conference "Transformations of Engineered Nanomaterials in the Environment", Prague Czech Republic August 2011

Co-organizer; ACS session on Environmental Applications and Implications of nanotechnology for the Division of Environmental Chemistry at PacificChem, Hawaii, December 2010

Ph.D. Students Advised

Brian Vencalek		2017 (exp)
Adam Cadawallader	(Coadvisor, J. VanBriesen)	2017 (exp)
Eric McGivney	(Coadvisor, J. VanBriesen)	2017 (exp)

Joe Moore	(Coadvisor, G. Lowry)	2016 (exp)
Erin Dauson	(Coadvisor, I. Oppenheim, D. Greve)	2015
Djuna Gulliver	(Coadvisor, G. Lowry)	2014
Arvind Murali Mohan		2013
Linchen Han		2013
Mei Sun	(Coadvisor, G. Lowry)	2012
Juan Peng		2012
Yan Xu	(Coadvisor, J. VanBriesen)	2012
Zhiqiang (Eric) Li	(Coadvisor, G. Lowry)	2011
Theresa Kirschling	(Coadvisor, G. Lowry, R. Tilton)	2011

M.S. Research Students Advised

Meng Chen Lee	2016	Supported Internally
Greg Healy	2015	Supported by NSF Grant
Brian Vencalek	2014	Supported by DOE Contract and US Army
David Zgonc	2014	Supported by US Army
Fei Lian	2011	Supported by DOE Grant
Adway Binwale	2011	Supported by DOE Contract
Linchen Han	2010	Supported by NSF/CEINT
Chan Il Jung	2010	Supported by NSF/CEINT
Michael Cynn	2009	Supported by DoE ORAU
Raghav Narayanan	2007	Supported Internally

Post-doctoral Students Advised

Erin Dauson	2015-Pres	Supported by NSF/DHTI
Daniel E. Ross	2014-2016	Supported by NSF/CEINT

Undergraduate Research Students Advised

Jack Ronayne	2017	Supported by SURG Fellowship
Angela Ng	2015-2016	Supported by SURF Fellowship
Kiana M. Morse	2015	Supported by NSF CEINT
Nicholas O'Hallaron	2014	Supported by SURF Fellowship
Kiana M. Morse	2014	Supported by NSF REU
Miriam Hegglin	2014	Supported by SURG Grant
Agnes Marszalik	2013	Supported by SURG Grant
Eileen Wu	2013	Supported by SURG Grant
Sophie Grodsinsky	2013	Supported by SURG Grant
Annette Ritchie	2013	Supported by SURG Grant
Nadia Shebaro	2013	Supported by NSF REU
Dawn Smith	2012	Supported by NSF REU
Sarah A. Welsh	2011	Supported by NSF REU
Andrew Stochetti	2009	Supported by SURF Fellowship
Pamela Torres	2008	Independent Study
Mike Cynn	2008	Independent Study

Jennifer Lawrence	2007	Supported by SURF Fellowship
Eric Briner	2007	Independent Study

Mainstream Press

Pittsburgh Post-Gazette, February 1, 2013. Newspaper article. Mt. Lebanon couple, CMU students work to transform water bottles into useful items. Focus on Engineers Without Borders.

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Gregory, Kelvin B (1997) Enhanced Biotransformation of Carbon Tetrachloride, Tetrachloroethene and 1,1,1-trichloroethane. The University of Iowa Department of Civil & Environmental Engineering, Iowa City IA. Advisor: Professor Gene F. Parkin