

CURRICULUM VITAE

KENNETH H. CARLSON

APPOINTMENT (8/98)

Professor of Civil Engineering
Department of Civil and Environmental Engineering
Colorado State University
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EDUCATION

Ph.D., Civil (Environmental) Engineering, August, 1996

University of Colorado – Boulder; Boulder, CO
Dissertation title: “Optimization of the Ozone and Biofiltration Processes for Multiple Drinking Water Treatment Objectives”

M.S., Civil (Environmental) Engineering, May, 1993

Colorado State University; Fort Collins, Colorado.
Thesis title: “Modeling VOC Removal in an Ozone Reactor”

B.S., Chemical Engineering, May, 1982

University of Wisconsin; Madison, WI

ACADEMIC POSITIONS

- 2014-present, Professor of Civil and Environmental Engineering, Department of Civil and Environmental Engineering, Colorado State University
- 2013-present, Director, Center for Energy Water Sustainability, Colorado State University
- 2005-2014, Associate Professor of Civil Engineering, Department of Civil Engineering/Environmental Engineering Program, Colorado State University
- 1998-2005, Assistant Professor of Civil Engineering, Department of Civil Engineering/Environmental Engineering Program, Colorado State University, Fort Collins, CO.
- 1993-1996, Graduate Research Assistant, Environmental Engineering, University of Colorado – Boulder, Boulder, CO.
- 1991-1992, Graduate Research Assistant, Environmental Engineering, Colorado State University, Fort Collins, CO.

OTHER POSITIONS

- 1996-1998, Senior Process Engineer, CH2M Hill, Denver, CO
- 1992-1996, Planning/Process Engineer, Fort Collins Water Utility, Fort Collins, CO
- 1985-1990, Process Engineering Group Leader, Intel Corp., Albuquerque, NM

CURRENT JOB DESCRIPTION

Dr. Carlson is the director of the Center for Energy Water Sustainability (CEWS) within the CSU Energy Institute. The CEWS is involved with research and industry collaboration in the water related shale oil and gas space and as director, Dr. Carlson coordinates and channels opportunities in these areas. Through the Center, Dr. Carlson has worked with industry, the Colorado Oil and Gas Conservation Commission, the Colorado Department of Natural Resources and the National Renewable Energy Lab on water quantity, water quality and water recycling issues. Current work includes the development of GIS-based tools to optimize water management in shale oil and gas operations and treatment of produced water for recycling as frac fluid or irrigation water.

Additional CEWS research projects include multiple DoD grants that are conducted in collaboration with the Center for Environmental Management of Military Lands. These include climate modeling for flooding and sea level rise at military bases around the world in addition to researching water quality issues at multiple Air Force bases, both domestic and international.

Dr. Carlson is responsible for teaching the graduate aqueous chemistry and environmental unit operations classes at CSU for the Environmental Engineering program. In addition, Dr. Carlson led the development of the Fundamentals of Natural Gas class in Spring 2012 and 2013. During 2012 and 2013, Dr. Carlson coordinated the successful ABET accreditation process for the undergraduate Environmental Engineering program within the Civil and Environmental Engineering Department.

HONORS AND AWARDS

- 2013, Department award for successfully coordinating ABET accreditation for the environmental engineering program.
- 2013, Abel Research Award for Economic Development, Colorado State University
- 2010, 3rd Place, (Advisor) National Student Design Competition, Water Environment Federation Technical Exposition and Conference, New Orleans, LA
- 2006, 3rd Place (with Amy Pruden), Best Scientific Paper Award, Environmental Science and Technology
- 2004, Faculty Pacesetter Award, Department of Civil and Environmental Engineering, Colorado State University, Fort Collins, CO
- 2003, Faculty Excellence in Research Award, Department of Civil and Environmental Engineering, Colorado State University, Fort Collins, CO
- 1999, Poster Session – Annual Conference 3rd Place, American Water Works Association Research Foundation, Denver, CO
- 1996, Academic Achievement Award, 1st Place Doctoral Dissertation, American Water Works Association, Denver, CO
- 1992, James Warner Scholarship, American Water Works Association

PUBLISHED WORKS

Peer-Reviewed Publications (94 total, H index 43, i-10 index 75, Citations 13094)

1. Quantitative decision making for a groundwater monitoring and subsurface contamination early warning network H Li, J Gu, A Hanif, A Dhanasekar, KH Carlson, *Science of The Total Environment* 683, 498-507, 2019.
2. Membrane-based treatment of shale oil and gas wastewater: The current state of knowledge, T Tong, KH Carlson, CA Robbins, Z Zhang, X Du, *Frontiers of Environmental Science & Engineering* 13 (4), 63, 2019.
3. Flood risk assessment methodology for planning under climate change scenarios and the corresponding change in land cover, A Hanif, A Dhanasekar, A Keene, H Li, K Carlson, *Journal of Water and Climate Change*, 16:2019.
4. Biodegradation of veterinary antibiotics in lagoon waters, J Cha, KH Carlson, *Process Safety and Environmental Protection* 127, 306-313, 2019.
S Kim, P Omur-Ozbek, KH Carlson, Characterization of Organic Matter in Water from Oil and Gas Wells Hydraulically Fractured with Recycled Water, *Journal of Hazardous Materials*, 4:034, 2019.
5. Kim, S., Sick, B., Omur-Ozbek, P., Carlson, KH (2019). Investigating the influence of hydraulic fracturing fluid type and well age on produced water quality: chemical composition, and treatment and reuse challenges. *Desalination and Water Treatment*, 146:39-56. DOI: <https://doi.org/10.5004/dwt.2019.23665>
6. Z Zhang, X Du, KH Carlson, CA Robbins, T Tong, 2019. Effective treatment of shale oil and gas produced water by membrane distillation coupled with precipitative softening and walnut shell filtration. *Desalination* 454, 82-90
7. X Du, Z Zhang, KH Carlson, J Lee, T Tong, 2018. Membrane fouling and reusability in membrane distillation of shale oil and gas produced water: Effects of membrane surface wettability. *Journal of Membrane Science* 567, 199-208
8. J Cha, KH Carlson, 2018. Occurrence of β -lactam and polyether ionophore antibiotics in lagoon water and animal manure. *Science of The Total Environment* 640, 1346-1353.
9. Son, J., A Hanif, A Dhanasekar, KH Carlson, 2018. Colorado Water Watch: Real-Time Groundwater Monitoring for Possible Contamination from Oil and Gas Activities – II. *Environmental Monitoring and Assessment* 190 (3), 138.
10. H Li, JH Son, A Hanif, J Gu, A Dhanasekar, K Carlson, 2017. Colorado Water Watch: Real-Time Groundwater Monitoring for Possible Contamination from Oil and Gas Activities – I. *Journal of Water Resource and Protection* 9 (13), 1660
11. Pica, N., Carlson, K.H., Steiner, J., Waskom, R., 2017. Produced water reuse for irrigation of non-food biofuel crops: Effects on switchgrass and rapeseed germination, physiology and biomass yield, *Industrial Crops and Products*, 100; 65-76.
12. Bai, B., Carlson, K.H., 2017. Spatial Analysis of Horizontal-Shale-Well Water Production in the Wattenberg Field, *Journal SPE: Oil and Gas Facilities*, 6(5) 31-36, DOI:10.2118/185964-PA.
13. Li, G., Bing Bai, and KH Carlson, 2016. Characterization of solids in produced water from wells fractured with recycled and fresh water. *Journal of Petroleum Science and Engineering* 144: 91-98.
14. Pica, Nasim E., Clay Terry, and Kenneth Carlson, 2016. Optimization of Apparent Peak Viscosity in Carboxylmethyl Cellulose Fracturing Fluid: Interactions of High Total

- Dissolved Solids, pH Value, and Crosslinker Concentration." *SPE Journal*, DOI: 10.2118/184396-PA.
15. Esmaeilirad, N.*, Terry, C., Kennedy, H., Carlson, K.H., 2016. Recycling Fracturing Flowback Water for Use in Hydraulic Fracturing: Influence of Organic Matter on Stability of Carboxyl-Methyl-Cellulose-Based Fracturing Fluids, *SPE Journal*, DOI: 10.2118/179723-PA
 16. Esmaeilirad, N., Terry, C. and Carlson, K., 2016. Optimization of carboxymethyl cellulose frac fluid in low TDS water sources based on pH and crosslinker concentrations. *Fuel*, 185, pp.211-218.
 17. Esmaeilirad, N., White, S., Terry, C., Prior, A., Carlson K., 2016. Influence of inorganic ions in recycled produced water on gel-based hydraulic fracturing fluid viscosity. *Journal Petroleum Science and Engineering*, 139:104-111.
 18. Kim, S., Omur-Ozbek, P., Dhanasekar, A., Prior, A. and Carlson, K., 2016. Temporal Analysis of Flowback and Produced Water Composition from Shale Oil and Gas Operations: Impact of Frac Fluid Characteristics. *Journal of Petroleum Science and Engineering*, 147, 202-210.
 19. Li, H.*, Son, JH*, Carlson KH, 2016. Concurrence of Aqueous and Gas Phase Contamination of Groundwater in the Wattenberg Oil and Gas Field of Northern Colorado, *Water Research*, 10.1016/j.watres.2015.10.031
 20. Son, J.H.*, S Kim, KH Carlson, 2015. Effects of Wildfire on River Water Quality and Riverbed Sediment Phosphorus, *Water, Air, & Soil Pollution* 226 (3), 1-13
 21. Cha, J., Yang, S., & Carlson, K. H. 2015. Occurrence of β -lactam and polyether ionophore antibiotics in surface water, urban wastewater, and sediment. *Geosystem Engineering*, 18(3), 140-150.
 22. Esmaeilirad, N.*, White, S., Terry, C., Kennedy, H., Prior, A., Carlson, KH, 2015. Influence of Inorganic Ions in Recycled Produced Water on Gel-Based Hydraulic Fracturing Fluid Viscosity, *Jour. Petrol. Sci and Eng.*, doi:10.1016/j.petrol.2015.12.021
 23. Bai*, B., Prior, A., Douglas, C., Carlson, K.H., 2015. Sources of Variability in Flowback and Produced Water Volumes from Shale Oil and Gas Wells, *Journal of Unconventional Oil and Gas Resources*, 12:1-5. DOI: 10.1016/j.juogr.2015.07.001.
 24. Esmaeilirad, N.*, Li, G.*, Kennedy, H., Terry, C., Carlson, K.H., 2015. Optimizing Metal Removal Processes for Produced Water with Electrocoagulation. *Jour. SPE – Oil and Gas Facilities*, 04/2015; 4(02):087-096. DOI:10.2118/173899-PA.
 25. Son, J.H.*, Goodwin, S., Carlson, K.H., 2015. Total Phosphorus Input to the Cache la Poudre River in Northern Colorado, *Wat. Env. Res.*, 87 (2), 169-178.
 26. Esmaeilirad, N.*, Omur-Ozbek, P., Carlson, K.H., 2014, Influence of Softening Sequencing on Electrocoagulation Treatment of Produced Water. *Jour. Haz. Mat.*, 283(2015)721–729.
 27. Goodwin, S.*, Carlson, K.H., Knox, K., Douglas, C., Rein, L., 2014. Water Intensity Assessment of Shale Gas Resources in the Wattenberg Field of Northeastern Colorado. *Environ. Sci. Tech.*, May 2014, 10.1021. *Environ. Sci. Tech.*, May 2014, 10.1021/es404675h
 28. Son, J.H.*, Carlson, K.H., 2014. Real-time surrogate analysis for potential oil and gas contamination of drinking water resources. *Appl. Wat. Sci.*, May 2014, DOI 10.1007/s13201-014-0190-x.
 29. Li, H.*, Carlson, K.H., 2014. Distribution and Origin of Groundwater Methane in the Wattenberg Oil and Gas Field of Northern Colorado, *Environ. Sci. Tech.*, January 2014, 10.1021/es

30. Bai, B.*, Goodwin, S.*, Carlson, K.H., 2013. Modeling of frac flowback and produced water volume from Wattenberg oil and gas field, *Journal of Petroleum Science and Engineering*, Volume 108, August 2013, Pages 383-392, ISSN 0920-4105, <http://dx.doi.org/10.1016/j.petrol.2013.05.003>.
31. Goodwin, S. *, Carlson, K.H., Bai, B.*, Rein, L., Knox, K. and Douglas, C. , 2013. Improved Water Use Estimates for Drilling and Hydraulic Fracturing in Northeastern Colorado, *Journal of Water Resource and Protection*, Vol. 5 No. 12, 2013, pp. 1262-1267. doi: 10.4236/jwar.2013.512135.
32. Son, J.H.*, Crowley, C., Arabi, M., Carlson, K.H., 2013. Relative phosphorus load inputs from wastewater treatment plants in a northern Colorado watershed. *J Environ Qual.* 2013 Mar-Apr;42(2):497-506. doi: 10.2134/jeq2012.0349.
33. Cho, S. *, Kim, D., Park, J., Carlson, K.H., 2013. Measuring the Applicability of Biosensors to Detect Possible Terror Chemicals in Water Distribution Network, *Jour. Env. Forensics*, February 2013, pp. 69-79.
34. Son, J.H.*, Carlson, K.H., 2012. Will stringent total nitrogen wastewater treatment plant discharge regulations achieve stream water quality goals?, *J. Environ. Monit.*, 2012, 14, 2921-2928.
35. Kim, S.C., Yang, J.E., Ok, Y.S., Jung, D.Y. and Carlson, K., 2012. Degradation kinetics of three veterinary antibiotics in composted and stockpiled manure. *Korean Journal of Soil Science and Fertilizer*, 45(1), pp.43-50.
36. Goodwin, S.,* Douglas, C., Knox, K., Carlson, K.H., 2012. Life Cycle Analysis of Water Use and Intensity of Oil and Gas Extraction in the Wattenberg Field, *Oil and Gas Journal*, 5 (2012) 48-56.
37. Kim, S.C.*, Yang, J.E., Ok, S.O., Lee, S.Y., Pruden, A., Storteboom, H., Carlson, K.H., 2011. Degradation Kinetics of Three Veterinary Antibiotics in Composted and Stockpiled Manure, *Bull. Env. Cont. and Tox.*, Manuscript No. BECT 3193.
38. Son, JH*, Carlson, K.H., 2011. Reactive Stream Stabilization for Minimizing Transport of Phosphorus, *Journal of Water Resource and Protection*, 3:7:504-512.
39. Kim, S.C.*, Carlson, K.H., 2010. Dissolved and Colloidal Fraction Transport of Antibiotics in Soil Under Biotic and Abiotic Conditions, *Wat. Qual. Res. Jour.*, 45(2010) 296-308.
40. Kim, S.C.*, Davis, J.G., Truman, C.C., Ascough, J., Carlson, K.H., 2010. Simulated Rainfall Study for Transport of Veterinary Antibiotics – Mass Balance Analysis, *Jour. Haz. Mat.*, 175(2010) 836-843.
41. Pei, R., Cha, J.*, Carlson, K.H., Pruden, A., 2007. Response of Antibiotic Resistance Genes (ARG) to Biological Treatment in Dairy Lagoon Water, *Environ. Sci. Technol.*, 41 (14):5108–5113.
42. Storteboom, H., Kim, S.C.*, Doesken, K., Carlson, K.H., Davis, J.G., Pruden, A., 2007, Response of Antibiotics and Resistance Genes to High-Intensity and Low-Intensity Manure Management, *J. Env. Qual.*, 36:1695-1703.
43. Kim, S.C.*, Carlson, K.H., 2007, Temporal and Spatial Trends in the Occurrence of Human and Veterinary Antibiotics in Aqueous and River Sediment Matrices, *Environ. Sci. Technol.*, 41(1); 50-57.
44. Kim, S.C.*, Carlson, K.H., 2006, Quantification of Human and Veterinary Antibiotics in Water and Sediment Using SPE/LC/MS/MS, *Anal. Bioanal. Chem.*, Published on-line 18 July 2006.
45. Davis, J.G., Truman, C.C., Kim, S.C.*, Ascough, J.C., Carlson, K.H., 2006, Antibiotic Transport via Runoff and Soil Loss, *J. Environ. Qual.*, 35:6:2250.

46. Pruden, A., Pei, R., Storteboom, H., Carlson, K.H., 2006, Antibiotic Resistance Genes as Emerging Contaminants: Studies in Northern Colorado, *Environ. Sci. Technol.*, 40(23); 7445-7450.
47. Kim, S.C.*, Carlson, K.H., 2006, Occurrence and Partitioning of Ionophore Antibiotics in Water and Sediments of a Mixed-Landscape Watershed, *Wat. Res.*, 40:2549.
48. Yang, S.*, Cha, J.M.*, Carlson, K.H., 2006, Trace analysis and occurrence of erythromycin and tylosin in influent and effluent wastewater by liquid chromatography combined with electrospray tandem mass spectrometry, *Jour. Anal. And Bioanal. Chem.*, 385:3:623
49. Pei, R., Kim, S.C.*, Carlson, K.H., Pruden, A., 2006, Effect of River Landscape on the Sediment Concentrations of Corresponding Antibiotics Resistance Genes, *Wat. Res.*, 40: 2427.
50. Cha, J.M.*, Yang, S.*, Carlson, K.H., 2006, Trace determination of β -lactam antibiotics in surface water and urban wastewater using liquid chromatography combined with electrospray tandem mass spectrometry. *J. Chromatogr. A.*, 1065:45.
51. Yang*, S., Cha, J.M.*, Carlson, K.H., 2005. Simultaneous extraction and analysis of 11 tetracycline and sulfonamide antibiotics in influent and effluent domestic wastewater by solid-phase extraction and liquid chromatography-electrospray ionization tandem mass spectrometry, *J. Chromatogr. A.*, 1097: 40.
52. Kim, S.C.*, Carlson, K.H., 2005. LC-tandem MS for quantifying trace amounts of pharmaceutical compounds in soil and sediment matrices. *Trends in Anal. Chem.*, 24:7:595.
53. Cha, J.M.*, Yang, S.*, Carlson, K.H., 2005. Rapid analysis of trace levels of antibiotic polyether ionophores in surface water by solid-phase extraction and liquid chromatography with ion trap tandem mass spectrometric detection. *J. Chromatogr. A* 1062: 531.
54. Byer, D.*, Carlson, K.H., 2005. Real-time Detection of Intentional Chemical Contamination in the Distribution System, *Jour. AWWA*, 97:3:46.
55. Allmann, T.S.*, Carlson, K.H., 2005, Feasibility Assessment of Intentional Distribution System Contamination, *Jour. AWWA*, 97:1:43.
56. Yang*, S., Cha, J.M.*, Carlson, K.H., 2004. Quantitative determination of trace concentrations of tetracycline and sulfonamide antibiotics in surface water using solid-phase extraction and liquid chromatography/ion trap tandem mass spectrometry, *Rapid Commun. Mass Spectrom.* 18: 2455.
57. Yang*, S., Carlson, K.H., 2004. Solid-phase extraction-high performance liquid chromatography-ion trap mass spectrometry for analysis of trace concentrations of macrolide antibiotics in natural and wastewater matrices, *J. Chromatogr. A* 1038: 141.
58. Yang, S.*, Carlson, K.H., 2004 Utility of Radioimmunoassay Methods for Measuring Antibiotics in Water, *Water Res.* **38**: 3155
59. McCurdy, K.*, Carlson, K.H., Gregory, D.*, 2004 Evaluation of Flocculation and Shearing Characteristics of Aluminum Polymers and Salts, *Water Res.* 38:2:486-494.
60. Yang, S.*, Carlson, K.H., 2003. Evolution of Antibiotic Occurrence in a River through Pristine, Urban and Agricultural Landscapes, *Water Res.* 37:19:4645.
61. Carr, M.C.*, Carlson, K.H., Gregory, D.*, 2003, Reformation of Chlorine Dioxide During High Chlorine Concentration Domestic Laundry Events, *Jour. Environ. Eng. and Sci.*, 2:5:2003.
62. Carr, M.C.*, Carlson, K.H., 2003, Membrane Integrity Monitoring with Distributed Laser Turbidimetry, *Jour. AWWA*, 95:6:56.
63. Gregory, D.*, Carlson, K.H., 2003, Relationship of pH and Flocculation Kinetics to Granular Media Filtration Performance, *Environ. Sci. Technol.*, 38:7:983.

64. McQuarrie, J.R.*, Carlson, K.H., 2003, Secondary Benefits of Aquifer Storage and Recovery - Disinfection By-product Control, *Jour. Envir. Engrg.*, ASCE, 129:5:362.
65. Gregory, D.*, Carlson, K.H., 2003, Impact of Soluble Manganese Concentration on Oxidation Kinetics, *Jour. AWWA*, 95:1:78.
66. Cocchia, S.*, Carlson, K.H., Marinelli, F.M.*, 2002, Use of TSS in Characterizing the Impact of Filter Backwash Recycling, *Jour. Envir. Engrg.*, ASCE, 128:3:256.
67. Ducoste, J.J., Carlson, K.H., Bellamy, W.D., 2001, The Integrated Disinfection Design Framework Approach to Reactor Hydraulics Characterization, *Jour. Wat. Suppl.: Res. & Technol.*, AQUA, 50:4:245.
68. Carlson, K.H., Bellamy, W.D., 2001, Use of a Mass Balance Model to Develop Guidelines for Treatment Plant Recycle Streams, *Wat. Sci. Tech.*, 1:4:169.
69. Henderson, R.*, Carlson, K.H., Gregory, D.*, 2001, The Impact of Ferrous Reduction of Chlorite on Overall Process Performance, *Wat. Res.*, 35:18:4464.
70. Gregory, D.*, Carlson, K.H., 2001, Ozonation of Dissolved Manganese in the Presence of Natural Organic Matter. *Ozone Sci. and Eng.*, 23:2:131.
71. Carlson, K.H., Amy, G.L., 2001, Optimization of the Ozone and Biofiltration Processes for Multiple Treatment Objectives, *Jour. AWWA*, 93:1:45.
72. Bellamy, W.D., Carlson, K.H., Pier, D.*, Ducoste, J., Carlson, M., 2000, Implementation of the Integrated Disinfection Design Framework, *Jour. AWWA*, 92:5:34.
73. Carlson, K.H., Via, S., Bellamy, W.D., Carlson, M., 2000, Secondary Impacts of Enhanced Coagulation, *Jour. AWWA*, 92:6:62.
74. Carlson, K.H., Gregory, D.*, 2000, Optimizing Water Treatment With Two Stage Coagulation, *Jour. Envir. Engrg.*, ASCE, 126:6:345.
75. Carlson, K.H., Amy, G.L., 2000, The Importance of Soluble Microbial Products (SMPs) in Biological Drinking Water Treatment, *Wat. Res.*, 34:4:1386.
76. Carlson, K.H., Knocke, W.R., 1999, Modeling Manganese Oxidation With Potassium Permanganate. *Jour. Envir. Engrg.*, ASCE, 125:10:892-896.
77. Carlson, K.H., Amy, G.L., 1998, Assessing BOM Removal During Biofiltration. *Jour. AWWA*, 90:12:78.
78. Carlson, K.H., Amy, G.L., 1997, The Formation of Filter Removable BOM during Ozonation, *Ozone Sci. and Eng.*, 19:2:145.
79. Carlson, K.H., Knocke, W.R., Gertig, K.R., 1997, The Role of Speciation in Developing Effective Iron and Manganese Removal Strategies. *Jour. AWWA*, 89:4:62.

Refereed Chapters in Books

1. Carlson, K.H., Kim, S.C. 2007, Analysis of Antibiotics in Soil, Sediment and Water Using HPLC/MS/MS. In: Comprehensive Analytical Chemistry, vol. 50: Analysis, Fate and Removal of Pharmaceuticals in the Water Cycle, edited by Mira Petrovic and Damia Barcelo.
2. Bannerjee, A., Carlson, K.H., 2001, Monitoring Membrane Integrity with Laser Turbidimetry, In: Membrane Practices for Water Treatment (S.J. Duranceau, Ed.), AWWA, Denver, CO, pp.121.
3. Carlson, K.H., Amy, G.L., Garside, J., Blais, G., 1996, Ozone Induced Biodegradation and Removal of NOM and Ozonation By-products in Biological Filters, In: Alternative Biological Filtration (M.R. Collins and N. J. D. Graham, Eds.), John Wiley and Sons, New York, NY, pp.61.

Non-Refereed Proceedings/Transactions

* Advisee

1. Carlson, K.H., Yarkin, M., 2007, Removal of Perchlorate through Riverbank Filtration and Aquifer Recharge and Recovery: Benefits of Water Treatment Residual, In Proceedings of the 2007 AWWA Water Quality Technology Conference, Charlotte, NC.
2. Sullivan, M.B., Carlson, K.H., 2007, Electrokinetic Soil Processing as a Supplement to Bank Filtration for Removing Persistent Organic Contaminants. In Proceedings of the 2007 AWRA Emerging Contaminants Workshop, Vail, CO.
3. Carlson, K.H., Brauer, R., 2006, Aurora Colorado's Prairie Waters Project Natural and Enhanced-Natural Purification Processes to Remove Bulk Organics and Nutrients, In: Proceedings of 2006 AWWA WQTC, Denver, CO.
4. Carlson, K.H., Watson, C.W., 2006, Evaluation of Reactive Stream Stabilization for Removing Agrichemical Contaminants, In: Proceedings of 2006 IWA World Water Congress, Beijing, China.
5. Cho, S., Carlson, K.H., 2006, Comparing different water quality instruments for On-line monitoring distribution system security, In: Proceedings of AWWA Water Security Conference, Washington D.C.
6. Kim, S.C., Carlson, K.H., 2006, Concentration and Environmental Loading of Veterinary Antibiotics in Agricultural Irrigation Ditches. In: Proceedings of 2006 USDA CSREES National Water Conference, San Antonio, TX.
7. Cho, S., Carlson, K.H., 2006, Indirect Detection of Intentional Chemical Contamination in the Distribution System Using Low Cost Turbidity Sensors, In: Proceedings of 2006 AWWA Water Quality Technology Conference, Denver CO.
8. Gregory, D.*, Carlson, K.H., 2002, Impact of pH and the Kinetics of Floc Formation on Filtration Performance, In: Proceedings of the 2002 AWWA Water Quality Technology Conference, Seattle, WA, AWWA, Denver, CO, (CD ROM).
9. Carlson, K.H., Johnson, C.*, 2001, The Application of Enhanced Laser Turbidimetry for Monitoring Filter Performance, In: Proceedings of Advances in Rapid Granular Media Filtration Conference, Imperial College, London, UK, CIWEM, p. 311.
10. Carr, M.*, Carlson, K.H., 2001, Chlorine Dioxide Formation in High Concentrations of Chlorine, In: Proceedings of the 2001 AWWA Annual Conference, Washington, DC, AWWA, Denver, CO, (CD ROM).
11. Rivers, P., Gregory, D.*, Carlson, K.H., 2001, Evaluation of Alternative Disinfection Strategies for Small/Medium Surface Water Utilities, In: Proceedings of the 2001 AWWA Annual Conference, Washington, DC, AWWA, Denver, CO, (CD ROM).
12. Cocchia, S.*, Carlson, K.H., 2000, Impact of Backwash Recycling on Water Treatment Plant Performance, In: Proceedings of the 2000 AWWA Annual Conference, AWWA, Denver, CO, (CD ROM).
13. McQuarrie, J.*, Carlson, K.H., 2000, The Removal of DBPs and DBP Precursors during Aquifer Storage; Results of a Simulated ASR Study, In: Proceedings of the 2000 AWWA Annual Conference, Denver, CO, AWWA, Denver, CO, (CD ROM).
14. Bannerjee, A., Carlson, K.H., Marinelli, F.*, 2000, Monitoring Membrane Integrity with Laser Turbidimetry, In: Proceedings of the 2000 AWWA Annual Conference, Denver, CO, AWWA, Denver, CO, (CD ROM).
15. Gregory, D.*, Carlson, K.H., 2000, Impact of Two-Stage Coagulation on Filtration Performance, In: Proceedings of the 2000 AWWA Water Quality Technology Conference, Salt Lake City, UT, AWWA, Denver, CO, (CD ROM).

16. Johnson, C.G.*, Carlson, K.H., 2000, Applicability of Laser Turbidimetry for Drinking Water Treatment, In: Proceedings of the 2000 AWWA Water Quality Technology Conference, Salt Lake City, UT, AWWA, Denver, CO, (CD ROM).
17. Rakness, K.R., Rexing, D., Zegers, R., Carlson, K.H., 2000, Optimizing *Cryptosporidium* Inactivation Credit with Ozone at Las Vegas Using the Integrated Disinfection Design Framework, In: Proceedings of the AWWA Water Quality Technology Conference, Salt Lake City, UT, AWWA, Denver, CO, (CD ROM).
18. Carlson, K.H., Bellamy, W., Pier, D.*, Ducoste, J., Bellamy, W., Carlson, M., 1999, Implementation of the Integrated Disinfection Design Framework, In: Proceedings of the 1999 AWWA Annual Conference, Chicago, IL, AWWA, Denver, CO, (CD ROM).
19. Carlson, K.H., Bellamy, W., Marinelli, F. *, 1999, The Relative Impact of Recycling on Process Performance, In: Proceedings of the 1999 AWWA Water Quality Technology Conference, Tampa, FLAWWA, Denver, CO, (CD ROM).
20. Ducoste, J.J., Carlson, K., Bellamy, W., Carlson, M., 1999, A Systematic Approach to Reactor Hydraulic Characterization: Part 1 of the Integrated Disinfection Design Framework Protocol, In: Proceedings AWWA Water Quality and Technology Conference, Tampa, FL, AWWA, Denver, CO, (CD ROM).
21. Carlson, K.H., McEwen, B., Gertig, K. R., Reed, B., 1998, Sand Ballasted Flocculation-Sedimentation: What's the Deal? In: Proceedings of the 1998 AWWA Annual Conference, Dallas, TX, AWWA.
22. Gregory, D.*, Carlson, K.H., Gertig, K.R., 1998, Pilot Scale Evaluation of Enhanced Coagulation for Treating Spring Runoff Water, In: Proceedings of the 1998 AWWA Annual Conference, Dallas, TX, AWWA.
23. Carlson, K.H., Via, S., Bellamy, W., Carlson, M., 1998, Secondary Impacts of Enhanced Coagulation, In: Proceedings of the 1998 AWWA Water Quality Technology Conference, San Diego, CA, AWWA.
24. Carlson, K.H., Rakness, K.R., MacMillan, S., 1997, Batch Testing Protocol for Optimizing Ozone System Design, In: Proceedings of the 1997 AWWA Annual Conference, Water Quality Division, Atlanta, GA, AWWA.
25. Gregory, D.*, Carlson, K.H., Gordon, G., Bubnis, B., 1997, Removal of Chlorite Ion using Sulfite Ion, In: Proceedings of the 1997 AWWA Water Quality Technology Conference, Denver, CO, AWWA.
26. Carlson, K.H., Amy, G.L., Blais, G., 1996, Integration of the Ozone and Biofiltration Processes to Provide NOM Removal and Biostability, In: Proceedings of the 1996 AWWA Annual Conference, Research Division, Toronto, ON, AWWA.
27. Carlson, K.H., Gregory, D., MacMillan S., 1996, The Efficacy of Preozonation and Enhanced Coagulation for Treating Low Alkalinity, High Color Water, In: Proceedings of the 1996 AWWA Annual Conference, Research Division, Toronto, ON, AWWA.
28. Carlson, K.H., Amy, G.L., Blais, G., MacMillan, S., 1996, The Importance of Soluble Microbial Products in Drinking Water Biofiltration, In: Proceedings of the 1996 AWWA Water Quality Technology Conference, Boston, MA, AWWA.
29. Carlson, K.H., Amy, G.L., 1995, The Relative Importance of HLR and EBCT on the Removal of BOM During Biofiltration, In: Proceedings of the 1995 AWWA Water Quality Technology Conference, New Orleans, LA, AWWA.
30. Carlson, K.H., Knocke, W.R., Gertig, K.R., 1994, The Relationship of Speciation to Iron and Manganese Removal, Strategies, In: Proceedings of the 1994 ASCE Environmental Engineering Conference, Boulder, CO, AWWA.

31. Carlson, K.H., Knocke, W.R., Gertig, K.R., 1994, Modeling the Oxidation of Manganese with Potassium Permanganate, In: Proceedings of the 1994 AWWA Annual Conference, Research Division, New York, NY, AWWA.
32. Carlson, K.H., Elmund, G.K., Gertig, K.R., 1994, Getting a Jump on the Information Collection Rule: Plant Scale Characterization of NOM and the Relationship to DBP Formation, In: Proceedings of the 1994 AWWA Water Quality Technology Conference, San Francisco, CA, AWWA.

Other (e.g. lab texts, book reviews, technical reports, in-house reports):

1. Carlson, K.H., 2006, CH2M HILL, Denver, CO, 112 pp. Phosphorus Removal During Aquifer Recharge and Recovery with Water Treatment Residual.
2. Carlson, K.H., Frazey, J., Byers, D., 2004, Methodology and Characteristics of Water System Infrastructure Security: Modeling White Paper, American Society of Civil Engineers, Reston, VA, 45 pp.
3. Carlson, K.H., Byers, D., Frazey, J., 2004, Methodology and Characteristics of Water System Infrastructure Security: Candidate Instruments and Observables White Paper, American Society of Civil Engineers, Reston, VA, 39 pp.
4. Watson, C.C., Carlson, K.H., Robeson, M.D., Eom, M., Jordan, B., Garza, G., 2004, Demonstration Erosion Control, Report to U.S. Army Corps of Engineers, Engineer Research and Development Center, Vicksburg, MS, Ver. D.9.8.2003, 206 pp.
5. Carlson, K.H., Byers, D., 2004, Methodology and Characteristics of Water System Infrastructure Security: Data Analysis White Paper, American Society of Civil Engineers, Reston, VA, 25 pp.
6. Carlson, K.H., Gregory, D., 2003, The Impact of Chemical Sequencing on Filtration Performance, American Water Works Association Research Foundation, 42 pp.
7. Roesner, L.A., Carlson, K.H., 2002, Potential Risks Associated with Raw Water Supplies Impacted by Urban Runoff, Non-Point Pollution, and/or Wastewater Effluents, Colorado Dept. of Public Health and Environment, Denver, CO, 143 pp.
8. Carlson, K.H., Gregory, D., 2002, Assessment of Drinking Water Treatment Options for the City of Longmont, CH2M HILL, Denver, CO, 53 pp.
9. Watson, C.C., Carlson, K.H., Robeson, M.D., Tillery, J., Eom, M., Jordan, B., Garza, G., Sutton, S., 2002, Demonstration Erosion Control Monitoring Sites 2002 Evaluation, Report to U.S. Army Corps of Engineers, Engineer Research and Development Center, Vicksburg, MS, Ver. I.12.10.2002, November, 159 pp.
10. Carlson, K.H., Marinelli, F. M., 2001, Impact of Backwash Recycling on Water Treatment Plant Performance, American Water Works Association Research Foundation, 108 pp.
11. Carlson, K.H., Bellamy, W.D., Ducoste, J.A., Rakness, K., 2001, Implementation of the Integrated Disinfection Design Framework, American Water Works Association Research Foundation, 152 pp.
12. Carlson, K. H., Johnson, C., 2001, The Application of Laser Turbidimetry for Water Treatment Optimization in Small Systems, Environmental Protection Agency – Small Systems Montana Water Center, 82 pp.
13. Watson, C.C., Thornton, C.I., Carlson, K.H., Bledsoe, B.P., Robeson, M. D., 2001, Demonstration Erosion Control Monitoring Sites, 2001 Evaluation, Report to U.S.

- Army Corps of Engineers, Engineer Research and Development Center, Vicksburg, MS, November, 161 p.
14. Carlson, K.H., Gregory, D., 2001, Investigation of Alternatives for Treatment of Aurora and Quincy Reservoir Water, CH2M HILL, Denver, CO, 41 pp.
 15. Carlson, K.H., Gregory, D., Noteboom, M., 2001, Big Thompson River Coagulation Optimization Study, CH2M HILL, Denver, CO, 21 pp.
 16. Carlson, K.H., Parsons, L.S., 1999, Assessing the Impact of the Use of Park Creek Reservoir Water on the Water Quality of Hamilton Reservoir, Platte River Power Authority, Fort Collins, 32 pp.
 17. Carlson, K.H., Bellamy, W.D., 1998, Secondary Impacts of Enhanced Coagulation and Enhanced Softening, American Water Works Association, Government Affairs Office,

CONTRACTS & GRANTS

Funded Projects as PI (total \$6.2M, since 2011 \$3.6M)

6/15 – 12/15	Center for Energy Water Sustainability Supporting Gift, \$10,000, AECOM, Inc.
1/15 - 12/15	Center for Energy Water Sustainability Supporting Gift, \$20,000, MWH Global
5/15 – 12/15	Investigation Of Water Recycling at Ball Corp.’s Fairfield, CA Aluminum Can Manufacturing Facility, \$60,000, Ball Corp.
10/15 – 10/16	Development of Cost Effective Produced Water Treatment Processes for Transferring Oilfield Wastewater to Agriculture for Beneficial Use, \$199,000, National Science Foundation.
5/15-12/15	Optimizing Oil Production With Recycled Water: the Role of TDS and Organic Matter, Noble Energy, \$60,000
7/15-7/18	Demonstration of Advanced Technologies for Treating Frac Flowback and Produced Water from Shale Oil and Gas Production for Agriculture Irrigation in Northeast Colorado: Addressing the Intersection of Energy, Water and Food, USDA Agricultural Experiment Station, \$90,000
5/15-12/16	Adaptation of GIS Based Modeling of Oil and Gas Water Management to Beneficial Agricultural End Uses, Department of Energy, Research Partnership for Secure Energy in America, \$250,000
7/14 – 7/15	Real-Time Water Monitoring of Oil and Gas Operation in Colorado, CO Department of Natural Resources \$100,000.
1/15 – 12/15	Fundamental Evaluation of Produced Water Treatment, MWH Global, \$20,000
6/14 - 6/15	Real-Time Water Monitoring of Oil and Gas Operations in Colorado, Noble Energy, \$500,000

5/14 – 12/14	Produced Water Quality Impacts on Frac Fluid Stability, Halliburton Energy Services, \$125,000
1/14 – 12/14	Life Cycle Assessment of Waste Streams for Oil and Gas Operations, Concord Produced Water Services, \$45,000
1/14 – 12/14	Fundamental Evaluation of Produced Water Treatment, MWH Global, \$50,000
11/13 – 4/14	Water Quality Characterization of Produced Water in Wattenberg Field, Encana Energy, \$48,000
5/13 – 2/14	Real-Time Water Monitoring of Oil and Gas Operation in Colorado, Consortium of CO Department of Natural Resources, Noble Energy and EPA, \$450,000.
2/13 – 2/15	Development of GIS-Based Tools for Optimizing Water Management in Shale Gas Operations, DOE-Research Partnership for Secure Energy in America, \$1,100,000.
12/13-6/13	Optimizing Electrocoagulation Treatment of Produced Water for Reuse as Frac Fluid, Halliburton, Inc., \$150,000
7/12-6/15	Utilizing New Technologies for Treating Frac Flowback and Produced Water from Shale Gas Production to Augment Water Supplies for Agriculture Irrigation, Agricultural Experiment Station, Colorado State University, \$111,000
1/12-6/12	Natural Gas Study: Electric Sector Impacts – Water Issues, National Renewable Energy Laboratory, Golden, CO, \$40,000.
1/12-8/12	Development of GIS Tool for Optimizing Water Management in Oil and Gas Operations, Noble Energy, Denver, CO, \$125,000.
12/11- 7/12	Assessing Water Intensity of Oil and Gas Development in the Wattenberg Field, Colorado. Noble Energy, Denver, CO, \$175,000.
7/09 – 7/12	Use of Reactive Impoundment and Drain (RID) Systems for Removing Nutrient, Pharmaceutical and Odor Contaminants from Animal Feed Operation Waste Lagoons, AES, Fort Collins, CO \$105,000.
7/05 – 7/08	Minimizing the Release of Animal Antibiotics from Aerobic and Anaerobic Lagoons, U.S. Dept. of Agriculture, AES, Fort Collins, CO, \$112,000.
6/06 – 12/07	Testing of Micro-Sensor Technology for Security Monitoring of Drinking Water Distribution Systems, ST-Infonox, \$98,300.
1/07 – 1/08	Amendments for Enhancing Water Quality Benefits from Aquifer Recharge and Recovery, PI, CH2M HILL, \$80,134.
10/05 – 10/06	Development of Reactive Stream Stabilization Structures for Controlling Pesticide and Nutrient Transport to Streams, PI (co-PI: Watson), U.S. Corps of Engineers, Vicksburg, MS, \$135,000.
10/05 – 10/06	Development and Testing of Surrogate Parameters for Monitoring Intentional Contamination of Drinking Water Distribution Systems, ST-Infonox, Mountain View, CA, \$52,000.
9/04 – 1/07	Amendments for Enhancing Water Quality Benefits from Bank Filtration and Aquifer Recharge and Recovery, PI, CH2M HILL, \$172,300.

2/04 – 6/04	Methodology and Characteristics of Water System Infrastructure Security–White Papers, American Society of Civil Engineers, Reston, VA, \$29,032.
1/04 – 12/04	Determination of Chlorine Dioxide Dosing Requirements Using Demand and Decay Analysis - 2004, Sole PI, CDG Inc., Allentown, PA, \$12,000.
11/03 – 11/06	Assessment of Electrokinetic Injection of Amendments for Remediation of Acid Mine Drainage, PI (co-PI: Pruden), U.S. Environmental Protection Agency, Washington DC, \$136,724.
9/03 – 9/06	Minimizing the Environmental Impact of Agricultural Antibiotic Use at the Watershed Scale, PI (co-PI: Pruden), U.S. Department of Agriculture, Washington D.C., \$450,000.
1/03 – 12/03	Determination of Chlorine Dioxide Dosing Requirements Using Demand and Decay Analysis, Sole PI, CDG Inc., Allentown, PA, \$9,500.
7/02 – 7/05	Assessing the Fate of Animal Antibiotics in Aerobic and Anaerobic Lagoons, Sole PI, U.S. Department of Agriculture-AES, Washington DC, \$112,500.
1/02 – 12/02	Determination of Chlorine Dioxide Dosing Requirements Using Demand and Decay Analysis - 2003, Sole PI, CDG Inc., Allentown, PA, \$6,000.
9/01 – 9/04	Evaluation of Enhanced Bank Stabilization Structures for Reducing Nutrient Contamination, Sole PI, U.S. Department of Agriculture, Washington DC, \$275,000.
5/01 – 12/01	Assessment of Drinking Water Treatment Options for the City of Longmont, Sole PI, CH2M HILL, Denver, CO, \$81,600.
1/01 – 12/01	Determination of Chlorine Dioxide Dosing Requirements Using Demand and Decay Analysis - 2002, Sole PI, CDG Inc., Allentown, PA, \$6,000.
11/00 – 5/02	Assessment of Low Pressure Membrane Integrity Tools, Sole PI, Hach Corporation, \$20,000.
7/00 – 7/02	Utilizing Bank Stabilization Structures for Controlling Nitrate and Phosphate Contamination of Ground Water and Surface Water Sources, Sole PI, U.S. Department of Agriculture - AES, \$37,000.
5/00 – 12/00	Investigation of Alternatives for Treatment of Aurora and Quincy Reservoir Water, Sole PI, CH2M HILL Inc., Denver, CO, \$9,100.
1/00 – 12/00	Determination of Chlorine Dioxide Dosing Requirements Using Demand and Decay Analysis - 2001, Sole PI, CDG Inc., Allentown, PA, \$6,000.
9/99 – 6/02	The Impact of Chemical Sequencing on Filtration Performance, Sole PI, American Water Works Association Research Foundation, Denver, CO, \$148,012.
9/99 – 11/00	Application of Laser Turbidimetry for Water Treatment Optimization in Small Systems, Sole PI, Small System Drinking Water Assistance Program, U.S. Environmental Protection Agency, Washington, DC, \$60,967.

7/99 – 6/00	Reduction of Disinfection By-products in Drinking Water with Anaerobic Biodegradation, Sole PI, Colorado State University Graduate School, Faculty Research Grant, \$4,500.
12/98 – 6/00	Assessing the Impact of Steady-state and Surge Recycling on Process Performance, Sole PI, American Water Works Association Research Foundation, Denver, CO, \$70,000.
12/98 – 4/99	Assessing the Impact of the Use of Park Creek Reservoir Water on the Water Quality of Hamilton Reservoir, Sole PI, Platte River Power Authority, Fort Collins, CO, \$9,088.
9/97 – 6/01	Development of Implementation Protocols for the Integrated Disinfection Design Framework, PI, American Water Works Association Research Foundation, Denver, CO, \$223,786.

Funded Projects as Co-PI (total \$4.85M)

9/16 – 3/19	USAF Enterprise-Wide Climate Change Assessments for Integrated Natural Resources Management Plans”, co-PI (Caldwell PI) \$2,950,000.
7/04 – 7/07	Role of Animal Waste Composting Protocols in Minimizing the Impact of Agricultural Antibiotics on Humans and the Environment, co-PI (PI: Pruden), U.S. Department of Agriculture - AES, Washington DC, \$111,000.
10/04 – 10/05	Development and Monitoring of Reactive Stream Stabilization Structures for Controlling Contaminant Transport to Streams, co-PI (PI: Watson), U.S. Corps of Engineers, Vicksburg, MS, \$285,000.
10/03 – 10/04	Demonstration Erosion Control Project 2004 – Development and Monitoring of Reactive Stream Stabilization Structures for Controlling Contaminant Transport to Streams, co-PI (PI: Watson), U.S. Corps of Engineers, Vicksburg, MS, \$309,000.
10/02 – 10/03	Demonstration Erosion Control Project 2003 - Development of Reactive Stream Stabilization Structures for Controlling Contaminant Transport to Streams, co-PI (PI: Watson), U.S. Corps of Engineers, Vicksburg, MS, \$535,000.
10/01 – 10/02	Demonstration Erosion Control Project 2002 - Watershed Impact of Stream Stabilization on the Fate and Transport of Phosphorus, co-PI (PI: Watson), U.S. Corps of Engineers, Vicksburg, MS, \$495,000.
7/01 – 7/04	Assessing the Use of Geosynthetic Clay Liners (GCLs) for Containment of Nutrient and Pharmaceutical Animal Feed Operation Wastes, co-PI (PI: Shackelford), U.S. Department of Agriculture - AES, Washington DC, \$144,000.

TEACHING

<u>Year</u>	<u>Semester</u>	<u>Course No./Title</u>	<u>Cr. Hrs.</u>	<u>Enrollment</u>
2010	Spring	CIVE 538 – Aqueous Chemistry	3	19
2010	Spring	CIVE 403 – Senior Design (50%)	3	92
2010	Fall	CIVE 541 – Unit Operations	4	18
2010	Fall	CIVE 402 – Senior Design (50%)	3	98
2010	Fall	CIVE 439 – Env. Eng. Concepts	3	21
2011	Spring	CIVE 538 – Aqueous Chemistry	3	29
2011	Spring	CIVE 403 – Senior Design (50%)	3	98
2011	Fall	CIVE 541 – Unit Operations	4	16
2011	Fall	CIVE 439 – Env. Eng. Concepts	3	16
2012	Spring	CIVE 538 – Aqueous Chemistry	3	29
2012	Spring	ENGR 480 – Intro. To Natural Gas Industry (50%)	3	36
2012	Fall	CIVE 541 – Unit Operations	4	16
2012	Fall	CIVE 439 – Env. Eng. Concepts	3	16
2013	Spring	CIVE 538 – Aqueous Chemistry	3	24
2013	Spring	ENGR 480 – Intro. To Natural Gas Industry (50%)	3	39
2013	Fall	CIVE 541 – Unit Operations	4	18
2013	Fall	CIVE 439 – Env. Eng. Concepts	3	21
2014	Spring	CIVE 538 – Aqueous Chemistry	3	22
2014	Fall	CIVE 541 – Unit Operations	4	scheduled
2014	Fall	CIVE 439 – Env. Eng. Concepts	3	scheduled

I taught five classes in 2010 and four classes in 2011 and as my research load increased in 2012, I bought out one class to reduce the teaching load to three classes. The teaching load has continued to be three classes per year, two graduate classes (aqueous chemistry and environmental unit operations) and one undergraduate (environmental engineering concepts).

Highlights of class improvements include the inclusion of the Water Environmental Federation Student Design Competition into CIVE 439 and more recently, the EPA Rainworks Competition. Teaching introductory environmental engineering concepts in the context of a real-world design competition has greatly enhanced the student learning.

In Fall of 2011, I coordinated the development of new class with an ENGR prefix, ENGR 480A2. The class, Fundamentals of the Natural Gas Industry, was developed as part of CSU's overall natural gas initiative that I am also a part of. Along with co-instructors Bryan Willson, Geosciences Chair Sally Sutton and CIVE professor Tom Sale, I developed the curriculum and syllabus. The class was well received by the students and was repeated in 2013. We are looking for support to continue the class in the future.

STUDENT ADVISING/GRADUATE SUPERVISION

Current Research Group:

1. Ashwin Dhanasekar (research scientist)
2. Nasim Esmailirad (PhD candidate)
3. Bing Bai (PhD candidate)
4. Huishu Li (PhD candidate)
5. Wanze Li (PhD candidate)
6. Seoungyun Kim (PhD candidate)
7. Shane White (MS candidate)
8. Drew Caschette (MS candidate)
9. Brian McCormick (MS candidate)
10. Martha Nunez (MS candidate)
11. Tim Medearis (MS candidate)
12. Jianli Gu (MS candidate)

Graduate Degrees Completed as Advisor:

Total PhD graduates: 9

1. Dean Gregory, 2003 (PhD)
2. David Byer, 2004 (PhD)
3. Sung-chul Kim, 2006 (PhD)
4. Jongmun Cha, 2007 (PhD)
5. Seongho Cho, 2007 (PhD)
6. Mary Beth Talty, 2007 (PhD)
7. Mustafa Yarkin, 2008 (PhD)
8. Jie Son, 2013 (PhD)
9. Stephen Goodwin, 2014 (PhD)

Total MS graduates: 37 with thesis

1. Lela Parsons, 1999 (MS Plan A)
2. David Pier, 1999 (MS Plan A)
3. James McQuarrie, 2000 (MS Plan A)
4. Sergio Cocchia, 2000 (MS Plan A)
5. Matt Gough, 2000 (MS Plan A)
6. Rich Henderson, 2000 (MS Plan A)
7. Cory Johnson, 2001 (MS Plan A)
8. Matt Noteboom, 2001 (MS Plan A)
9. Mary Carr, 2002 (MS Plan A)
10. Michael Haines, 2003 (MS Plan A)
11. Kevin McCurdy, 2003 (MS Plan A)
12. Timothy Allmann, 2003 (MS Plan A)
13. Joel Tillery, 2003 (MS Plan A)
14. John Frazey, 2004 (MS Plan A)
15. Ben Lengacher, 2004 (MS Plan A)
16. Mustafa Yarkin, 2004 (MS Plan A)
17. Ashraf Al-Zagal, 2005 (MS Plan A)
18. Kelly LaValley, 2005 (MS Plan A)

19. David Holland, 2006 (MS Plan A)
20. Lauren Glushik, 2006 (MS Plan A)
21. Amy Zimmerman, 2006 (MS Plan A)
22. Rebecca Newton, 2007 (MS Plan A)
23. Koray Daver, 2008 (MS Plan A)
24. Caleb Douglas, 2010 (MS Plan A)
25. Chris Mitchell, 2010 (MS Plan A)
26. Jie Son, 2010 (MS Plan A)
27. Stephen Goodwin, 2011 (MS Plan A)
28. Qian Liang, 2011 (MS Plan A)
29. Husihu Li, 2012 (MS Plan A)
30. Bing Bai, 2012 (MS Plan A)
31. Ildus Mingadetzinov, 2012 (MS Plan A)
32. Ashwin Dhanasekar 2013 (MS Plan A)
33. Xi Jiang, 2013 (MS Plan A)
34. Amol Kitwadkar 2014 (MS Plan A)
35. Xiachen Yang, 2014 (MS Plan A)
36. Brad Sick, 2014 (MS Plan A)
37. Ryan Hutcherson, 2014 (MS Plan A)
38. Gen Li, 2015 (MS Plan A)
39. Wanze Li, 2015 (MS Plan A)

Total Postdoctoral Students / Research Associates: 5

1. Ashwin Dhanasekar, 2013 – present
2. Asma Hanif, 2013 - 2015
3. Jie Son, 2013 – 2015
4. Dean Gregory, 2003-2004
5. Fred Marinelli, 1998-2000

Outreach/Service

As coordinator for the Environmental Engineering program within our department, I am supporting curriculum and ABET activities related to the program. I was responsible for the coordination and presentation of the ABET self-study for the Environmental Engineering program within the CIVE department. I worked with the CIVE coordinator and an editor to complete the self-study and met with ABET examiner during the visit. In general, the ABET evaluation was positive with a few relatively minor deficiencies noted.

I also act as the coordinator for the Environmental Engineering program within our department, answering questions for prospective students, and representing the program as the pod leader in the Scott Bioengineering building. Outside of the department, I have been very active in the organization of the Natural Gas Symposium for the past three years and am the director of the Center for Energy Water Sustainability at the CSU Energy Institute. I give numerous presentations to civic, educational and government groups regarding hydraulic fracturing and water resources. In addition, I have responded to multiple requests for interviews from media sources including the Weather Channel, Denver Post, Coloradoan, Greeley Tribune and others.

University Committees:

Powerhouse Institute Faculty Advisory Committee, 2012 - present

Natural Gas Symposium Organizing Committee 2011 - present

College Committees:

Scott Bioengineering Building Design Committee, Environmental Engineering Pod Coordinator
2010 - present

College ABET Committee 2012-2103

Department Committees:

Environmental Engineering Undergraduate Program, Chair, 2010 - present

ABET Committee – Environmental Engineering program representative, 2012 - 2013

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

Memberships in professional societies

- Member, American Society of Civil Engineers
- Member, American Chemical Society
- Member, International Water Association
- Member, Society of Petroleum Engineers

Grant review panels

- Unsolicited Proposal Review Committee – American Water Works Association Research Foundation, Denver, CO.

- Tailored Collaboration Review Committee – American Water Works Association Research Foundation, Denver, CO.
- National Research Initiative, U.S. Department of Agriculture, Washington, DC.

Manuscript Refereeing, peer reviewer for journal articles in:

- *Journal AWWA*
- *Journal of Chromatography A*
- *Science of the Total Environment*
- *Ozone Science and Engineering*
- *Journal of Hazardous Materials*
- *Environmental Science and Technology*
- *Water Research*
- *Environmental Technology*
- *Water Science and Technology*
- *Environmental Engineering and Science*
- *Journal of Water Supply: Aqua*
- *Journal of Environmental Engineering, ASCE*
- *Journal of Petroleum Science and Engineering*