## ARIZONA STATE UNIVERSITY

School of Sustainable Engineering and The Built Environment

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Paul K. Westerhoff, Ph.D., PE, BCEE, NAE Born 1967

Regents Professor

Fulton Chair of Environmental Engineering

School of Sustainable Engineering and The Built Environment

Civil, Environmental and Sustainable Engineering Program

Education:

1995 Ph.D. University of Colorado at Boulder, Civil, Arch., and Env. Engineering

1991 M.S. University of Massachusetts, Amherst, Civil and Env. Engineering

1989 B.S. Lehigh University, Civil Engineering

Academic Experience

2018- Regents Professor, ASU

2019- Fulton Chair of Environmental Engineering, ASU

2017-2019 Vice Dean for Research and Innovation, FSE, ASU

2016-2017 Interim Vice Dean for Research and Innovation, FSE, ASU

2015-2016 Senior Advisor to the Provost for Engineering & Science, ASU

2014-2015 Vice Provost for Academic Research Programming, ASU

2011-2014 Associate Dean for Research, Ira A. Fulton Schools of Engineering, ASU

2007-2018 Professor, Arizona State University, Civil, Env. & Sustainable Engineering

2009-2010 Founding Director, School of Sustainable Engineering & The Built Environment

2008 - 2009 Chair, Department of Civil and Environmental Engineering, ASU

2001-2007 Associate Professor, Arizona State University, Civil and Env. Engineering

1995-2001 Assistant Professor, Arizona State University, Civil and Env. Engineering

Industrial Experience

1991-1992 Process Engineer, CH2M Hill Inc., Denver, Colorado

* 1. Assistant Engineer Intern (summers) Malcolm Pirnie Inc.

Principal Areas of Teaching and Research

*Teaching:* Environmental Chemistry, Physical and chemical treatment processes in environmental engineering; Sanitary systems design; Intermediate engineering design and technical writing

*Research:* Occurrence, characterization and oxidation of natural organic matter (NOM); Removal of oxo-anions from drinking water; Algal metabolites and algal biotechnology; Wastewater reuse; Emerging contaminants; Environmental Nanotechnology

Awards

2023 Inducted to the National Academy of Engineering

2023 Appointed Trustee, AWWA Water Science and Research Division

2023 Clarivate Web of Science Highly cited researchers in top 1% of citations for Environment & Ecology (2023, 2022, 2021, 2020, 2019, 2018, 2017,2016,2015)

2022 ***ACS ES&T Engineering* Best Paper Award** for 2021: “A Review of Advances in Engineering Nanomaterial Adsorbents for Metal Removal and Recovery from Water: Synthesis and Microstructure Impacts” *Environmental Science and Technology: Engineering*, 1:4:623-661 <https://doi.org/10.1021/acsestengg.0c00174> (2021)

2021 AWWA Membrane Treatment Best Paper award for publication ([*Managing and treating per- and polyfluoroalkyl substances (PFAS) in membrane concentrates*](https://doi.org/10.1002/aws2.1233)) published in *AWWA Water Science*

2021 Daniel Jankowski Legacy Award

2020 A.P. Black Award

2019 NWRI Clark Prize

2019 USEPA Level II Scientific and Technological Achievement Award (STAA), for collaborative publication entitle “*Nationwide study on the prevalence and potential health effects of contaminants of emerging concern in drinking water*”

2018 WEF Fair Distinguished Engineering Educator Medal

2018 Elected International Water Association (IWA) Fellow

2017 Sustainable Nanotechnology Organization (SNO) Achievement Award for demonstrating a commitment to impactful research and services that deepen the scientific community’s understanding of issues related to sustainable nanotechnology

2017 Editors Choice Award for 2016 in *Environmental Science: Water Research & Technology* of the paper entitled “N-Nitrosamine Formation Kinetics in Wastewater Effluents and Surface Waters”

2017 Journal AWWA Water Resources and Sustainability Best Paper Award for “Severe Weather Impacts on Water Quality in Central Arizona”

2016 One of the 14 Inaugural Members of the UMASS CEE Academy of Distinguished Alumni

2016 Fulton Faculty Exemplar, ASU (2 year recognition award)

2016 Best Paper Award “Extent and Impacts of Unplanned Wastewater Reuse in US Rivers”, Journal American Water Works Association – AWWA Water Resources Sustainability Division Best Paper Award

2015 Listed in “The World’s most influential scientific minds 2015 “as “Highly cited researchers” by Thomson Reuters in the category “Environment/Ecology“ (out of 132 names).

2015 Journal of Environmental Quality Best Paper Award for “The Release of Nanosilver from Consumer Products Used in the Home” by Benn, T., Cavanagh, B., Hristovski, K., Posner, J.D., Westerhoff, P.J. (*Journal of Environmental Quality*, 39:6:1875-1882 [2010])

2015 ASU Outstanding Doctoral Mentor for 2015 (1 of 3 awardees campus wide)

2014 American Academy of Environmental Engineers Certification Board – appointed by eminence in the specialty of Water Supply and Wastewater as a Board Certified Environmental Engineer (BCEE)

2014 Journal of Environmental Monitoring, Most cited research article from the 2012 Impact Factor Award for “Occurrence and removal of titanium at full scale wastewater treatment plants: implications for TiO2 nanomaterials”

2013 Journal AWWA, Water Science & Research Division Best Paper Award “GAC Removal of Organic Nitrogen and Other DBP Precursors”

2013 ARCADIS/AEESP Frontier in Research Award

2012 Nathan Burbank Environmental Educator Award, AZ Water

2011 Ira A. Fulton Schools of Engineering AY2010-11 Top 5% Teachers List Award

2010 Appointed as a Senior Sustainability Scientist to the Global Institute of Sustainability, Arizona State University

2007 Promotion and Tenure Faculty Exemplar, Arizona State University, Salary increasing and $50,000 for discretionary funds over five years.

2007    Selected to attend the National Academy of Engineering Frontiers of Science conference at Microsoft in Seattle, WA

2006 Paul L. Busch Research Award from Water Environment Research Foundation Endowment for Innovation in Applied Water Quality Research, Tools to Characterize and Understand the Risk of Biogenic and Commercial Nanomaterials in Wastewater Effluents ($100,000)

2005 Barrett, The Honors College award for 2005-2006 Honors Disciplinary Faculty

2005 Awwa Annual Conference Poster Symposium First Place Award “Aerogel-GAC Composites for Arsenic and Uranium Removal”, Water Science and Research Division (Westerhoff, Badruzzaman, Navarnoaragon Coleman, Reynolds, Gammon, Genetti)

2005 Walter L. Huber Civil Engineering Research Prize for “Reactions between natural organic matter and micropollutants with ozone, chlorine, and bromine”.

2004 *Journal of Environmental Engineering* “Editor’s Award” (for consistently rated as excellent in evaluating manuscripts) From Mark Rood, Editor

2003 AWWA Water Quality and Technology Conference Third Place (out of 41) Poster Award for “Dissolved Organic Nitrogen Analysis in Drinking Water”

2001 Quentin Mees Research Award, Arizona Water Pollution Control Association for “Removal of MIB and Geosmin in Surface Water Treatments in Arizona”

2000 WEFTEC Annual Conference Poster Symposium First Place Award “Characterization of wastewater organic matter during full-scale treatment” (Esparza-Soto and Westerhoff)

1999 American Water Works Association Journal Publications Best Overall Paper Award

1999 American Water Works Association Water Quality Division Best Journal Paper Award.

1997 Quentin Mees Research Award, Arizona Water Pollution Control Association, for paper entitled “A

model for predicting bromide oxidation by ozone and HO radicals to bromate and the potential role for ozone in treating Arizona surface waters”

1993 Annual CH2M Hill University Funding Award through Univ. of Colorado ($1,000)

1994 American Water Works Association (Rocky Mountain Section) James B. Warner Scholarship

($1,000)

Sponsored Nominee for NSF and NATO International Water Quality Conference in Varna,

Bulgaria (Travel and housing allowance ~$1,500)

American Chemical Society Award of Merit for authorship and presentation of “Evaluation of

Rate Constants for Dissolved Ozone Decay and Bromate Formation” at the 206th ACS-

Division of Environmental Engineering Conference (1993)

American Chemical Society Award of Merit for co-authorship and presentation of “Comparison

of Bromide-Ozone Reactions with NOM Separated by XAD-8 Resin and UF/RO

Membranes” at the 206th ACS-Division of Environmental Engineering Conference

(1993)

Honor Societies: Tau Beta Pi, Chi Epsilon, Phi Eta Sigma

Appointments

2020-present Executive Editor, *Environmental Science and Technology*

2021- present Advisory Board Member, Institute for Nanotechnology and Water Sustainability (iNanoWS), University of South Africa (UNISA)

2021-present Member, NAE/NAS/NAM , “Environmental Impact of Currently Marketed Sunscreens and Potential Human Impacts of Changes in Sunscreen Usage”

2018-2019 Member, ad hoc review committee to conduct a quadrennial review of the National Nanotechnology Initiative (NNI), contributing to NAE / NAS / NAM concensus report: “A Quadrennial Review of the National Nanotechnology Initiative Nanoscience, Applications, and Commercialization”, 103 pages (2020)

2017-2021 Water Research Foundation Non-Regulated DBP Technical Advisory Committee (member)

2017-2019 Environmental Science and Technology – Journal Editorial Advisory Board

2014 -2017 Water Research Foundation Nitrosamine/Emerging DBP Technical Advisory Committee (member)

2015- US-EU Nanomaterial Exposure Community of Researchers (co-chair)

2009-2015 US Environmental Protection Agency Science Advisory Board (SAB) – Environmental Engineering Committee

2009-2015 Research Advisory Council, member, WateReuse Association

2007-2013 Expert Panel on EDC/PPCPs, AwwaRF/Water Research Foundation

2004-2007 Environmental/Water group coordinator, Department of Civil and Environmental Engineering, Arizona State University

2005-2010 International Advisory Board member Journal of Water Supply: Research and Technology – AQUA

2005-2007 Member of the AwwaRF Public Council on Drinking Water Research

Scientific and Professional Societies

American Water Works Association (AWWA)

American Chemical Society

International Ozone Association

International Water Association

American Environmental Engineering Science Professors

Arizona Water Pollution Control Association

International Humic Substances Society

American Society of Civil Engineers

Water Environment Federation

# Refereed Archival Journal Papers

1. “Particle Size and Chemical Effects on Contact Filtration Performance”, J.E. Tobiason, G.S. Johnson, P. Westerhoff.  *ASCE Journal of Environmental Engineering*, 119:3:520-539 (1993).
2. “Empirically and Theoretically-Based Models for Predicting Brominated Ozonation By-products”, M. Siddiqui, G.Amy, K.Ozekin, P. Westerhoff. *Ozone Science and Engineering*, 16:2:157-178 (1994).
3. “Removal of Bromate after Ozonation during Drinking Water Treatment”, M.Siddiqui, G.Amy, K.Ozekin, W. Zhai, P. Westerhoff. *Journal of American Water Works Association*, 86:10:81-96 (1994).
4. “Bromate Formation and Control During Water Treatment”, R. Song, R. Minear, P. Westerhoff, and G. Amy. *Environmental Technology* , 17:861-868 (1996).
5. “Empirical Modeling of Bromate Formation During Ozonation of Bromide-Containing Waters”, R. Song, C. Donohue, R. Minear, P. Westerhoff, K. Ozekin, G. Amy. *Water Research*, 30:5:1161-1168 (1996).
6. “Modeling and Risk Analysis of Bromate Formation from Ozonation of Bromide-Containing Waters”, R. Minear, R. Song, P. Westerhoff, G. Amy, *Water Science and Technology*, 34:7-8:79-85 (1996).
7. “Applications of Ozone Decomposition Models”, P. Westerhoff, G. Amy, R. Song, and R. Minear. *Ozone Science and Engineering*, 19:1:55-74 (1997).
8. “Bromate Minimization during ozonation”, R. Song, P. Westerhoff, R. Minear, G. Amy, *Journal of American Water Works Association*, 89:6:69-78 (1997).
9. “Numerical Kinetic Models for Bromide Oxidation to Bromine and Bromate”, P. Westerhoff, R. Song, G. Amy, and R. Minear. *Water Research*, 32:5:1687-1699 (1998).
10. “NOM’s Role in Bromine and Bromate Formation During Ozonation”, P. Westerhoff, R. Song, G. Amy, and R. Minear. *Journal of American Water Works Association*, 90:2:82-94 (1998). Selected JAWWA Best Paper of the Year in the Water Quality Division & Best paper Overall in the journal
11. “Molecular Ozone and Radical Pathways of Bromate Formation during Ozonation”, Ozekin, K., Westerhoff, P., Amy, G., Siddiqui, M., *Journal of Environmental Engineering-ASCE* , 124:5:456-462 (1998).
12. “Modeling Dissolved Ozone And Bromate Ion Formation In Ozone Contactors”, M. Siddiqui, G. Amy, K. Ozekin, and P. Westerhoff, *Journal of Air, Water, and Soil* , 108:1-2:1-32 (1998).
13. “Relationships Between The Structure of Natural Organic Matter and Its Reactivity Towards Molecular Ozone and Hydroxyl Radicals”, P. Westerhoff, G. Aiken, G. Amy, and J. Debroux. *Water Research,* 33:10:2265-2276 (1999).
14. “Ozone-Induced Changes in Natural Organic Matter Structure”, P. Westerhoff, J. Debroux, G. Aiken, G. Amy, *Ozone Science and Engineering*, 21:6:551-570 (1999).
15. “Tracking residual DOC using XAD-fractionation and C13-NMR spectroscopy in indirect potable reuse” (1999) Drewes JE, Sprinzl, M, Wendrock, A, Williams, MD, Fox, P, Westerhoff, P, *Vom Wasser*, 93:95-107.
16. “Dissolved organic carbon transformations during lab-scale recharge using lagoon-treated wastewater”(2000), P. Westerhoff and M. Pinney, *Waste Management,* 20:75-83.
17. “Transformations in Dissolved Organic Carbon Through a Constructed Wetlands”, M. Pinney, P. Westerhoff, L.Baker, Water Research, 34:6:1897-1912 (2000)
18. “Nitrate removal from groundwater by cyanobacteria: quantitative assessment of factors influencing nitrate uptake” (2000) Q. Hu, P. Westerhoff, W. Vermaas, *Applied and Environmental Microbiology*, 66:1:133-139.
19. “Approaches for Applying Disinfection By-Product Models to Full-Scale Water Treatment Plants: A Case Study in the Paris-Area, France” (2000). P. Westerhoff, J. Debroux, G. Amy, D. Gatel, V. Mary, J. Cavard, *Journal of American Water Works Association*, 92:3:89-102.
20. “Concentrations and characteristics of organic carbon in surface water in Arizona: influence of urbanization”, P. Westerhoff, D. Anning, *Journal of Hydrology*, 236:202-222 (2000).
21. “Spectofluorometric Characterization of dissolved organic matter for indication of precursor organic material and aromaticity”, McKnight, D.M., E.W. Boyer, P.K. Westerhoff, P. Doran, T. Kulbe, D.T. Andersen. *Limnology and Oceanography*, 46:1:38-48 (2001).
22. Esparza-Soto, M., and Westerhoff, P. K. (2001). “Fluorescence spectroscopy and molecular weight distribution of extracellular polymers from full-scale activated sludge biomass.” *Water Science and Technology*, 43(6), 87-95.
23. Chao, P. and Westerhoff, P. “Assessment and optimization of chemical and physicochemical softening processes” *Journal American Water Works Association*, 94(3), 109-119 (2002).
24. Westerhoff, P., Chen, W., and Esparza, M. (2001). “Fluorescence analysis of a standard fulvic acid and tertiary treated wastewater.” *Journal of Environmental Quality*, 30(6), 2037-2046 (2001).
25. Nguyen, M. L., Baker, L. A., and Westerhoff, P., “DOC and DBP precursors in western US watersheds and reservoirs” *Journal American Water Works Association*, 94(5), 98-112 (2002).
26. Bruce, D., Westerhoff, P., and Brawley-Chesworth, A., “Removal of 2-methylisoborneol and geosmin in surface water treatment plants in Arizona.” *Journal of Water Supply Research and Technology-Aqua*, 51(4), 183-197 (2002).
27. “Dissolved organic nitrogen in drinking water supplies: A review”, P. Westerhoff and H. Mash, *Journal of Water Supply Research and Technology-Aqua*, 51:8: 415-448 (2002).
28. “Reduction of nitrate, bromate, and chlorate by zero valent iron (Fe-0)”, Westerhoff P, *Journal of Environmental Engineering – ASCE*, 129 :1:10-16 (2003).
29. “Biosorption of humic and fulvic acids to live activated sludge biomass”, Esparza-Soto, M. and Westerhoff, P., *Water Research*, 37:10:2301-2310 (2003).
30. “Nitrate removal by zero valent iron in packed columns”, P. Westerhoff and J. James, *Water Research*, 37:8:1818-1830 (2003).
31. “HPLC-fluorescence detection and adsorption of bisphenol A, 17b-estrodiol, and 17a-ethynyl estradiol on powered activated carbon”, Yoon, Y., Westerhoff, P., Snyder, S. A., and Esparza, M., *Water Research*, 37:14:3530-3537 (2003).
32. “Pharmaceuticals, Personal Care Products, and Endocrine Disruptors in Water: Implications for the Water Industry”, S. Synder, P. Westerhoff, Y. Yoon, D. Sedlak, *Environmental Engineering Science*, 20:5:449-469 (2003)
33. “Fluorescence Excitation-Emission Matrix Zone Integration to Quantify Spectra for Dissolved Organic Matter”, Wen Chen, Paul Westerhoff, Jerry A. Leenheer, and Karl Booksh, *Environmental Science and Technology,* 37:24:5701-5710 (2003)
34. “Canal wall brushing - a control measure for taste and odor problems in drinking water supplies in arid environments”, Hu, Q., M. Sommerfeld, L. Baker, P. Westerhoff, Journal of Water Supply: Research and Technology – AQUA, 52:8:545-554 (2003)
35. “Reactivity of natural organic matter with aqueous chlorine and bromine”, P. Westerhoff, P-F Chao, H. Mash, *Water Research*, 38:6:1502-1513 (2004).
36. Alum, A., Yoon, Y., Westerhoff, P., and Abbaszadegan, M., Oxidation of Bisphenol A, 17β-Estradiol, 17α-Ethynyl Estradiol and By-product Estrogenicity, *Environmental Toxicology*, 19:3:257-264 (2004)
37. “Dissolved organic matter in Arizona reservoirs: end-member analysis”, H. Mash, P. Westerhoff, L. Baker, R. Nieman, *Organic Geochemistry*, 35:831-843 (2004).
38. “Biological Attenuation of EDCs and PPCPs: Implications for Water Reuse”, Shane A. Snyder, Joseph Leising, Paul Westerhoff, Yeomin Yoon, Heath Mash, and Brett Vanderford *Ground Water Monitoring and Remediation,* 24:2: 108-118 (2004)
39. “Intraparticle diffusion and adsorption of arsenate onto granular ferric hydroxide (GFH)”, Mohammad Badruzzaman, Paul K. Westerhoff, Detlef Knappe *Water Research*, 38:18:4002-4012 (2004).
40. “Removal of 17-β Estradiol and Fluoranthene by Nanofiltration and Ultrafiltration Membranes”, Y. Yoon, P. Westerhoff, J. Yoon, S. Snyder, *ASCE J. Environmental Engineering*, 130:12:1460-1467 (2004).
41. “Dissolved Organic Nitrogen Measurement Using Dialysis Pretreatment” W. Lee and P. Westerhoff, *Environmental Science and Technology*, 39(3); 879-884 (2005).
42. “Rapid small scale column tests for arsenate removal in iron oxide packed bed columns”, Paul Westerhoff, David Highfield, Mohammad Badruzzaman, Yeomin Yoon, *ASCE Journal of Environmental Engineering*, 131:2:262-271 (2005).
43. “Endocrine Disruptor, Pharmaceutical, and Personal Care Product Fate During Simulated Drinking Water Treatment Processes”, Westerhoff, P., Snyder, S., Yoon, Y., Wert, E., *Environmental Science and Technology*, 39:17:6649-6663 (2005).
44. “Adsorption of 3H-labeled 17-β estradiol on powdered activated carbon”, Y. Yoon, P. Westerhoff, S.A. Snyder, *Water, Air, & Soil Pollution*, 116:1-4:343-351 (2005).
45. “Characteristic and Reactive of Algae-Produced Dissolved Organic Carbon” Nguyen, M-L., Westerhoff, P., Baker, L., Hu, Q., Esparza-Soto, M., Sommerfeld, M., *ASCE Journal of Environmental Engineering*, 131:11:1574-1582 (2005)
46. Seasonal Occurrence and Degradation of 2-Methylisoborneol in water supply reservoirs, P. Westerhoff, M. Rodrequez-Hernandez, L.Baker, M.Sommerfeld, *Water Research*, 39:20:489-4912 (2005)
47. Nanofiltration and ultrafiltration of endocrine disrupting compounds, pharmaceuticals and personal care products, Yoon, Y., Westerhoff, P. Snyder, S., Wert, E., *Journal of Membrane Science*, 270:88-100 (2006).
48. “Comparison of dissolved-organic-carbon residuals from air- and pure-oxygen-activated-sludge sequencing-batch reactors” M. Esparza-Soto, P. Fox, and P. Westerhoff, *Water Environment Research*, 78:3:321-329 (2006)
49. “Transformation of molecular weight distributions of dissolved organic carbon and UV-absorbing compounds at full-scale wastewater-treatment plants”, M. Esparza-Soto and P. Westerhoff, *Water Environment Research*, 78:3:253-262 (2006)
50. “An adaptive management strategy using multiple barriers to control taste and odor problems in the metro-Phoenix water supply”, Baker, L.A., Westerhoff, P., Sommerfeld, M., *J American Water Works Association*, 98:6:113-126 (2006).
51. “Arsenic adsorptive media technology selection strategies”, Westerhoff, P., DeHaan, M., Martindale, A., Badruzzaman, M., *Water Quality Research Journal of Canada*, 41:2:171-184 (2006)
52. “Occurrence and removal of dissolved organic nitrogen in US water treatment plants”, Lee, W., Westerhoff, P., Esparza-Soto, M., *Journal American Water Works Association*, 98:10:102-110 (2006).
53. “Kinetics of MIB and Geosmin Oxidation during Ozonation”, Westerhoff, P., Nair, B., Peng, P., *Ozone Science and Engineering*, 28:277-287 (2006).
54. “Character of organic matter in soil-aquifer treatment systems”, Drewes J.E., Quanrud, D.M., Amy, G.L., Westerhoff, P., *Journal of Environmental Engineering –ASCE* 132 (11): 1447-1458(2006)
55. “Dissolved organic nitrogen removal during water treatment by aluminum sulfate and cationic polymer coagulation”, Lee, W., Westerhoff, P., *Water Research*, 40:3767-3774 (2006).
56. “Fabrication of uniform size titanium oxide nanotubes: Impact of current density and solution conditions”, Satoshi Kaneco, Yongsheng Chen, Paul Westerhoff and John C. Crittenden, *Scripta Materialia*, 56:373-376 (2007)
57. "A hybrid sorbent utilizing nanoparticles of hydrous iron oxide for arsenic removal from drinking water", P. Sylvester, P. Westerhoff, T. Moller, M. Badruzzaman and O. Boyd, *Environmental Engineering Science*, 24(1), 104-112 (2007)
58. Leenheer, J. Dotson, A., Westerhoff, P., “Dissolved organic nitrogen fractionation”, *Annals of Environmental Science,* Vol 1, 45-56 (2007).
59. “Detection of arsenic in groundwater using a surface plasmon resonance sensor”, Erica S. Forzani, Kyle Foley, Paul Westerhoff and Nongjian Tao, *Sensors and Actuators B: Chemical*  123:1:82- 88 (2007)
60. “Removal of endocrine disrupting compounds and pharmaceuticals by nanofiltration and ultrafiltration membranes”, Y. Yoon, P. Westerhoff, S. Snyder, E. Wert, J. Yoon, *Desalination*, 202:1-3:16-23 (2007)
61. “Vanadium removal by metal (hydr)oxide adsorbents”, Naeem, A., Westerhoff, P., and Mustafa, S. *Water Research*, 41:7:1596-1602 (2007)
62. “Factors affecting formation of haloacetonitriles, haloketones, chloropicrin and cyanogen halides during chloramination” Yang X, Shang C, Westerhoff P, *Water Research*, 41:6:1193-1200 (2007)
63. “Comparison of Colorimetric and Membrane Introduction Mass Spectrometry Techniques for Chloramine Analysis”, Wontae Lee, Paul Westerhoff , Xin Yang , and Chii Shang, *Water Research* 41:14: 3097-3102 (2007). Erratum published in 41:18:4271-4271.
64. Electron Pulse Radiolysis Determination of Hydroxyl Radical Rate Constants with Suwannee River Fulvic Acid and Other Dissolved Organic Matter Isolates, Paul Westerhoff, Stephen P. Mezyk, William J. Cooper, Daisuke Minakata, *Environmental Science and Technology*, 41:13:4640-4646 (2007).
65. Selecting metal oxide nanomaterials for arsenic removal in fixed bed columns: From nanopowders to aggregated nanoparticle media, Hristovski, K., Baumgardner, A., Westerhoff, P., *Journal of Hazardous Materials*, 147:1-2:265-274 (2007)
66. Dissolved organic nitrogen as a precursor for chloroform, dichloroacetonitrile, N-Nitrosodimethylamine, and Trichloronitromethane, W. Lee, P. Westerhoff, J-P Croue, *Environmental Science and Technology,* 41:15:5485-5490 (2007)
67. Antimony Leaching from polyethylene terephthalate (PET) Plastic Used For Bottled Drinking Water”, Paul Westerhoff, Panjai Prapaipong, Everett Shock, Alice Hillaireau, *Water Research*, 42:3:551-556 (2008)
68. Stability and Removal of Water Soluble CdTe Quantum Dots in Water, Zhang, Yang; Chen, Yongsheng; Westerhoff, Paul; Crittenden, John, *Environ. Sci. Technol.,* 42 :1 :321-325 (2008)
69. Arsenate removal by nanostructured ZrO2 spheres, Hristovski, K., Westerhoff, P., Crittenden, J., Olson, L., *Environmental Science and Technology*, 42:10:3786-3790 (2008).
70. Stability of Commercial Metal Oxide Nanoparticles in Water, Yang Zhang, Yongsheng Chen, Kiril Hristovski, Paul Westerhoff, John C Crittenden, *Water Research*, 42:8-9:2204-2212 (2008)
71. Correlations between organic matter properties and DBP formation during chloramination, X. Yang, C. Shang, W. Lee, P. Westerhoff, C. Fan, *Water Research*, 42:8:2329-2339 (2008)
72. Hristovski, K., Westerhoff, P., Möller, T., Sylvester, P., Condit, W., Mash, H., Simultaneous Removal of Perchlorate and Arsenate by Ion Exchange Media Modified with Nanostructured Iron (Hydr)Oxide, *Journal of Hazardous Materials*, 152:1:397-406 (2008)
73. Benn, T. and Westerhoff, P. “Nanoparticle Silver Released into Water from Commercially Available Sock Fabrics” *Environmental Science and Technology*, 42:11:4133-4139 (2008)
74. Physicochemical Treatment of Three Chemotherapy Drugs: Irinotecan, Tamoxifen, and Cyclophosphamide, Chen, Z., Park, G., Herckes, P., Westerhoff, P., *J. Advanced Oxidation Technologies* , 11:2:254-260 (2008)
75. Arsenate Removal by Iron (Hydr)Oxide Modified Granulated Activated Carbon: Modeling Arsenate Breakthrough with the Pore Surface Diffusion Model, Hristovski, K., Westerhoff, P. Crittenden, J. Separation Science and Technology, 43:11,3154-3167 (2008)
76. Quantification of C60 Fullerene Concentrations in Water, Chen, Z., Westerhoff, P., Herckes, P., Environmental Toxicology and Chemistry, 27:9:1852-1859 (2008)
77. “An Approach for Evaluating Nanomaterials for Use as Packed Bed Adsorber Media: A Case Study of Arsenate Removal by Titanate Nanofibers” Hristovski, K., Westerhoff, P., Crittenden, J., *Journal of Hazardous Materials*, 156:604-611 (2008)
78. Effect of synthesis conditions on nano-iron (hydr)oxide impregnated granulated activated carbon, K.Hristovski, P. Westerhoff, T. Moller, P. Sylvester, *Chemical Engineering Journal*, 146:237-243 (2009).
79. Hristovski, K., Nguyen, H., Westerhoff, P. Removal of arsenate and 17α- ethinyl estradiol (EE2) by iron (hydr)oxide modified activated carbon fibers, J. Environ. Sci. Health, Part A. Vol. A44, No.4, 354-361 (2009).
80. Nitrosamine, Dimethylnitramine, and Chloropicrin Formation during Strong Base Anion-Exchange Treatment, Kemper, J.M., Westerhoff, P., Dotson, A., Mitch W., *Environmental Science and Technology*, 43:2:466-472 (2009).
81. Chen, B., Nam, S., Westerhoff, P., Krasner, S., Amy, G. “Fate of Effluent Organic Matter and DBP Precursors in an Effluent-Dominated River: A Case Study of Wastewater Impact on Downstream Water Quality”, *Water Research*, 43:6:1755-1765 (2009).
82. Krasner, S., Westerhoff, P., Chen, B., Rittmann, B., Nam, S., Amy, G. “Impact of Wastewater Treatment Processes on Organic Carbon, Organic Nitrogen, and DBP Precursors in Effluent Organic Matter", *Environmental Science and Technology*, 43:8:2911-2918 (2009)
83. Koeneman, B., Zhang, Y., Hristovski, K., Westerhoff, P., Chen, Y., Crittenden, J.C., Capco, D.G., Experimental approach for an in vitro toxicity assay with non-aggregated quantum dots, *Toxicology in Vitro*, 23: 955-962 (2009)
84. Lee, W., Westerhoff, P. “Formation of organic chloramines during water disinfection - chlorination versus chloramination”, *Water Research,* 43:8:2233-2239 (2009)
85. Dotson, A., Westerhoff, P., Krasner, K., Nitrogen Enriched DOM Isolates and their Affinity to Form Emerging DBPs, *Water Science and Technology* , 60:1: 135-143(2009)
86. Hristovski, K., Danasekaran, B., Tibaquirá, J., E., Posner, J.D., Westerhoff, P., “Producing Drinking Water from Hydrogen Fuel Cells”, *Journal of Water Supply: Research and Technology – AQUA*, 58:5:327-335 (2009)
87. Kiser, M.A., Westerhoff, P., Benn, T., Wang, Y., Pérez-Rivera, J., Hristovski, K. “Titanium Nanomaterial Removal and Release from Wastewater Treatment Plants”, *Environmental Science and Technology*, 43:17:6757-6763 (2009)
88. Zhang, Q., Crittenden, J., Hristovski, K., Hand, D., Westerhoff, P. “User-Oriented Batch Reactor Solutions to the Homogeneous Surface Diffusion Model for Different Activated Carbon Dosages”, *Water Research*, 43:7:1859-1866 (2009)
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**Patent Disclosures, Applications and Awards**

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2. Ersan, M.S., Armstrong, N., Westerhoff, P. Screening to Identify Commercially Available Advanced Oxidation Processes to Remove PFASs from Groundwater. ACS Spring 2023, March 26-30, 2023. Indianapolis, Indiana (Oral Presentation).
3. Mulchandani, A., Zeng, C., Westerhoff, P. Atmospheric Water Capture: An emerging way to reuse water from the air. *Water Reuse Symposium*, Atlanta, GA, March 7, 2023
4. Emily Briese, Srishti Gupta, Christopher Munich, Paul Westerhoff, “Computational method to predict adsorption kinetics from atomistic energetics: Iron and Alumina Surfaces,” ASU 13th Annual Graduate Research Symposium, Tempe, AZ, February (2023)
5. Emily Briese, Ken Niimi, Paul Westerhoff, “Informed Sorbent Design Towards Selectivity of Target Oxo-anions,” ARCS Scholar Showcase, Tempe, AZ, March (2023)
6. J. Molar\*, P. Herckes, M. Fraser and P. Westerhoff, Photocatalytic Abatement of N2O and NOx in Semiconductor Exhaust Streams. *Techcon 2023*, Austin, TX, September 10-12, 2023.
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13. Zhe Zhao, Yihao Luo, Paul Westerhoff, Bulk and genomic biofilm responses to UV-C light by Side-emitting optical fibers. Association of Environmental Engineering and Science Professors (AEESP), Boston, MA. June 20-24, 2023. Oral presentation.
14. Tzu-Heng Wang, YenJung Sean Lai, Ruey-an Doong4 Paul Westerhoff3, Bruce Rittaman, Carbon Valorization Leveraged by a Dual-fiber System for Photocatalysis, Association of Environmental Engineering and Science Professors (AEESP), Boston, MA. June 20-24, 2023. Oral presentation.
15. Jessica A. Deaver, Paul Westerhoff, Jacob L. Jones, Aaron J. Bel, Christopher R. Winkler4, and Douglas F. Call, **Evaluating the composition of microbial polyphosphate granules in full-scale enhanced biological phosphorus removal from domestic wastewater,** Association of Environmental Engineering and Science Professors (AEESP), Boston, MA. June 20-24, 2023. Oral presentation.
16. Paul Westerhoff, Natural, Incidental and Engineered nanomaterials in surface waters: Occurrence and catalytic reactivity influences on micropollutant degradation plus phosphorus turnover rates, Chinese Academy of Sciences, September (2023) - **INVITED**
17. Paul Westerhoff, Broad Utilization of the Electromagnetic Spectrum To Enable Nanotechnology to Treat Drinking Water, Tsinghua University, September (2023) - **INVITED**
18. Westerhoff, P., Zeng, C., Mulchandani, A. **Atmospheric Water Extraction:** Water Quality & a new Arizona Testbed, DARPA Program meeting, May (2023) - **INVITED**
19. Westerhoff, P., Wastewater effluents impact PFAS concentrations at Drinking water treatment plants: Sucralose and Predicted De facto Wastewater Reuse Levels Correlate with PFAS Levels in Surface Waters, EPA Webinar, January (2023) - **INVITED**
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27. Westerhoff, P., Herckes, P., Sharma, N., Occurrence & Characterization of bromine- and iodine-species in water: Impacts on DBP formation, IWA NOM8, Johannesburg, South Africa, December (2023) - **INVITED**
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29. Westerhoff, P. “How environmental engineers are driving innovation across multiple sectors”, University of Pittsburgh, March (2023) - **INVITED**
30. Westerhoff, P. “Natural, Incidental and Engineered nanomaterials in surface waters: Occurrence and catalytic reactivity influences on micropollutant degradation plus phosphorus turnover rates”, University of Vienna, Australia, June (2023) - **INVITED**
31. Shapiro, N., Westerhoff, P., Zhao, Z. “Experimental &Ray-Tracing Model Simulates Chemical Actinometry & Radiometric Measurements for UV-C Side Emitting Optical Fibers”, WQTC, November (2023)
32. Zhe Zhao, Paul Westerhoff, Biofilm Inhibition on Surfaces by Ultraviolet Light Side-emitted from Optical fibers. ACS Spring 2023, Indianapolis, IN. March 25-29, 2023. Oral presentation.
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39. Westerhoff, P. “Broad Utilization of the Electromagnetic Spectrum To Enable Nanotechnology to Treat Drinking Water”, NANO Congress, May 13-15, Monterrey, Nuevo Leon, Mexico (2021)
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63. Mulchandani, A., Edberg, J., Malinda, S., Westerhoff, P. Atmospheric Water Capture: A decentralized on-demand drinking water technology. *US Africa Forum on Nanotechnology Convergence for Sustainable Energy, Water and Environment*, Johannesburg, South Africa, August 14, 2019.
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65. Mulchandani, A., Edberg, J., Westerhoff, P. Atmospheric Water Capture: A decentralized drinking water technology. *ASU Environmental Engineering Seminar*, Tempe, AZ, February 12, 2019.
66. Mulchandani, A., Malinda, S., Edberg, J., Westerhoff, P. Atmospheric water capture capacity is enhanced using photothermal nanomaterial enabled desiccants. *Sustainable Nanotechnology Organization Conference*, San Diego, CA, November 7, 2019. (poster)  Awarded 3rd place in poster competition
67. Mulchandani, A., Edberg, J., Malinda, S., Westerhoff, P. Atmospheric Water Capture: A decentralized on-demand drinking water technology. *US Africa Forum on Nanotechnology Convergence for Sustainable Energy, Water and Environment*, Johannesburg, South Africa, August 14, 2019. (poster)
68. Venkatesh, K., Sinha, S., Zeng, C., Atkinson A., Sharma, N., Ashani H., Hjelmstad A., Das P., Westerhoff P. RSSCT and Field Pilot-scale adsorption columns for PFAS removal: A comparative Study. *Water Quality Technology Conference, Dallas*, TX, November 3, 2019. (poster). Awarded second place in student poster competition.
69. Venkatesh, K., Sinha, S., Zeng, C., Atkinson A., Sharma, N., Ashani H., Hjelmstad A., Das P., Westerhoff P. Assessing Conventional and Nano-based technologies for PFAS Removal at Pilot-Scale. *Sustainable Nanotechnology Organization Conference*, San Diego, CA, November 7, 2019. (poster).
70. Zeng, C., Atkinson A., Sharma, N., Ashani H., Hjelmstad A., Venkatesh, K., Sinha, S., Das P., Westerhoff P. Sorption of perfluoroalkyl substances in groundwater on activated carbon and ion exchange resin columns. *Regional Water Quality Workshop*, Tempe, AZ, October 4, 2019.
71. Juliana Levi, Chung-Seop Lee, Sujin Guo, Shalinee Kavadiya, Sergi Garcia-Segura, Chen Zhou, Mike Wong, Zachary Holman, Bruce Rittmann, Paul Westerhoff, Nano-Enabled Hollow Fibers for the Treatment of Nitrate, SNO annual conference, November, San Diego (2019)
72. Mariana Lanzarini Lopes, Paul Westerhoff, Sergi Garcia-Segura, Zhe Zhao, Brandon Cruz, Control of Surface Bio-growth by UV-C Side Emitting Optical Fibers, SNO annual conference, November, San Diego (2019)
73. Westerhoff, P. and Pandorf, M. “Carbon nanoparticles reduce nitrate leaching through soil and improve yield of lettuce (*Lactuca sativa*)” ACS conference, Orlando, FL (2019)
74. Westerhoff, P. and Sharma, N. “Occurrence and speciation of Iodine in Surface and Groundwaters of USA”, DBP Gordon Conference, NH (2019)
75. Nguyen, T., Westerhoff, P. “Modeled De Facto Reuse in Drinking Water Sources in the Colorado River Basin”. 2019 CAP LTER Poster Competition, Tempe, Arizona, USA, January 11, 2019.
76. Nguyen, T., Westerhoff, P. “Modeled De Facto Reuse in Drinking Water Sources in the Colorado River Basin”. 2019 AZ Water Research Symposium, Tempe, Arizona, USA, January 8, 2019.
77. Nguyen, T., Westerhoff, P. “De Facto Reuse Impacts on Drinking Water Quality at Public Water Systems”. The 16th EPA Annual DrinkingWater Workshop in Cincinnati, Ohio, USA, September 25, 2019.
78. O, Alrehaili. S, Sinha. F, Perreault. P, Westerhoff. “Improving Reverse Osmosis Recovery with a Minimum/Free Energy Membrane Distillation for Wastewater Reclamation” Presented at 92nd Annual AZ Water Conference & Exhibition, April 2019- Phoenix
79. Hanigan, D., Poustie, A., Thurman, E. M., Ferrer, I., Westerhoff, P., Roback, S. L., Ishida, K. P., Plumlee, M. H. Identifying NDMA Precursors in Advanced Treated Water for Potable Reuse. International Water Association 2nd Disinfection and Disinfection By-products Conference., Beijing, PRC. May 16, 2018
80. Mulchandani, A., Westerhoff, P. Improving capabilities of atmospheric water capture systems: Photothermal nanomaterials enhance kinetics of water vapor desorption from desiccants. *American Chemical Society National Meeting and Exposition*, Boston, MA, August 22, 2018.
81. Mulchandani, A., Atkinson, A., Garcia-Segura, S., Westerhoff, P. Playing with “nano-blocks” enables learning about environmental applications of nanotechnology. *American Chemical Society National Meeting and Exposition*, Boston, MA, August 20, 2018.
82. Mulchandani, A., Westerhoff, P. Photothermal nanomaterials improve energy efficiency of desiccants for atmospheric water capture. *2018 Materials Research Society Spring Meeting and Exhibit*, Phoenix, AZ, April 5, 2018.
83. Mulchandani, A., Westerhoff, P. Making water from thin air: Using the atmosphere as an alternative freshwater reservoir to supplement rising water demands. *2018 AZ Water Association Research Symposium,* Phoenix, AZ, January 9, 2018. (poster) Awarded 2nd place in poster competition
84. Nguyen, T., Westerhoff, P. “Upstream Wastewater Discharges Impact Two–Thirds of Drinking Water Surface Intakes in Texas, USA”. 2018 CAP LTER Poster Competition, Tempe, Arizona, USA, January 5, 2018.
85. Nguyen, T., Westerhoff, P. “Upstream Wastewater Discharges Impact Two–Thirds of Drinking Water Surface Intakes in Texas, USA”. 2018 International Symposium Potable Reuse Poster Presentation, Austin, Texas, USA, January 22-23, 2018.
86. Nguyen, T., Westerhoff, P. “Upstream Wastewater Discharges Impact Two–Thirds of Drinking Water Surface Intakes in Texas, USA”. 8th Annual SSEBE Graduate Research Symposium Poster Competition, Tempe, Arizona, USA, February 16, 2018.
87. A, Atkinson, Y, Bi, P, Firth, O, Alrehaili, P, Westerhoff, Z, Holman “Nanoparticle Spraycoating is a Flexible, Scalable Method for Manufacturing Water Treatment Membranes with Improved Energy Efficiency” Material Research Society- Spring Meeting & Exhibit, April 2018- Phoenix.
88. O, Alrehaili, A, Atkinson, Y, Bi, P, Firth, P, Westerhoff, Z, Holman “Nanoparticle Spray Coating with Aerosol Impact-Driven Assembly is a Versatile and Scalable Technique for Increasing Water Treatment Membrane Functionality” 256th American Chemical Society National Meeting, August 2018- Boston
89. Atkinson, A\*, S. Donovan, N. Fischer, O. Alrehaili P. Herckes, P. Westerhoff (2019) ‘Removal of polyDADMAC low molecular weight impurities significantly reduces N-nitrosodimethylamine (NDMA) formation at bench and pilot scales.’ (poster) AEESP Conference 2019, Phoenix, AZ. May 2019
90. Atkinson, A\*, O. Apul, S. Garcia-Segura, P. Westerhoff . (2018) ‘Implementation of nanobubble based technologies in water treatment.’ (oral) 256th ACS National Meeting, Nanobubbles: A Sustainable Solution for Water Treatment and Agricultural Applications , Boston, MA. August 2018
91. Atkinson, A\*, J. Markovski, H. Lee, F.C. Brown, H. Ashani, S. Sinha, K. Hristovski, P. Westerhoff . (2018) ‘Nanoenabling activated carbon based point-of-use water filtration devices for added functionality.’ (oral) 256th ACS National Meeting, From Lab to Tap: Implications of Scaling up Nano-enabled Environmental Technologies, Boston, MA. August 2018.
92. Atkinson, A\*, C. Powell, M. Wong, P. Westerhoff . (2018) ‘Magnetic Nanoparticle Recovery Device (MagNeRD) Enables Large Scale Application of Iron Oxide Nanoparticles for Water Treatment.’ (oral) 256th ACS National Meeting, From Lab to Tap: Implications of Scaling up Nano-enabled Environmental Technologies, Boston, MA. August 2018.
93. Mulchandani, A.\*, A. Atkinson, S. Garcia-Segura, P. Westerhoff . (2018) ‘Playing with "nano-blocks" enables learning about environmental applications of nanotechnology.’ (oral) 256th ACS National Meeting, From Nano to Macro: How to Let Students Discover the Applications of Materials, Boston, MA. August 2018
94. Alrehaili, O.\*, A. Atkinson, Y. Bi, P. Firth, P. Westerhoff, Z. Holman. (2018) ‘Nanoparticle Spray Coating with Aerosol Impact-Driven Assembly (AIDA) is a Versatile and Scalable Technique for Increasing Water Treatment Membrane Functionality.’ (oral) 256th ACS National Meeting, From Lab to Tap: Implications of Scaling up Nano-enabled Environmental Technologies, Boston, MA. August 2018.
95. Dietrich, L.\*, A. Atkinson, A. Venkatesan, P. Westerhoff,. (2018) ‘Low Removal of As (V) and Cr (VI) by POU Devices Until Enabled with Selective Ion Exchange Media.’ (oral) 256th ACS National Meeting, From Lab to Tap: Implications of Scaling up Nano-enabled Environmental Technologies, Boston, MA. August 2018.
96. Atkinson, A., Y. Bi, P. Firth, O. Alrehaili\*, P. Westerhoff, Z.C. Holman (2018) ‘Nanoparticle Spraycoating is a Flexible, Scalable Method for Manufacturing Water Treatment Membranes with Improved Energy Efficiency’ (poster) 2018 Materials Research Society Spring Meeting & Exhibit, Phoenix, AZ. April 2018.
97. O, Alrehaili. S, Sinha. F, Perreault. P, Westerhoff “System Level Membrane Distillation to Improve Reverse Osmosis Recovery of Reclaimed Wastewater” Presented at American Water Works Association- Annual Conference & Exhibit (ACE). June 2019- Denver
98. Hanigan, D., Poustie, A., Thurman, E. M., Ferrer, I., Westerhoff, P., Roback, S. L., Ishida, K. P., Plumlee, M. H. Identifying NDMA Precursors in Advanced Treated Water for Potable Reuse. International Water Association 2nd Disinfection and Disinfection By-products Conference., Beijing, PRC. May 16, 2018
99. Hanigan, D., Truong, L., Simonich, M., Tanguay, R., Westerhoff, P. Evaluating Toxicity Using Zebrafish Embryo Development: Sunscreens and Disinfection By-products. American Water Works Association Annual Conference and Exposition, Las Vegas, NV. June 13, 2018
100. Ashani, H., Khalid, A., Apul, O., Sinha, S., Westerhoff, P. Removal of Perfluorinated Chemicals (PFCs) from Arizona Groundwater by Carbonaceous Nanomaterials. May, Arizona Water 91st Annual Conference. Phoenix, AZ (2018
101. Westerhoff, P and Bi, X., “Development of a powder assay kit to fast detect gold nanoparticles in aquatic media” , 12th International Conference on the Environmental Effects of Nanoparticles and Nanomaterials (ICEENN) , Birmingham, UK, Sept 3-6 (2017)
102. Westerhoff, P. “Reactivity Towards N-Nitrosamine Formation from of Bulk and Trace Organics of Wastewater Origin”, ACS Conference, San Francisco, CA, March (2017)
103. Bi, X. and Westerhoff, P. “ Issue of interchangeable use of reactivity assessment assays for nanoparticle colloids in liquid solution”, ACS Conference, San Francisco, CA, March (2017)
104. Hanigan, D., Ferrer, I., Thurman, M., Plumlee, M., Ishida, K., Roback, S., Westerhoff, P. “NDMA Precursor Transformation and Identification During RO + UV/AOP for Indirect Potable Reuse”, ACS Conference, San Francisco, CA, March (2017)
105. Bi, Y., Han, B., Perrault, F., Westerhoff, P. “Evaluation of Ag-NP Stability on RO Membrane Using a Novel Water Jetting System”, AEESP Annual Conference, June (2017)
106. Cornwell, D., Westerhoff, P., Fischer, N. “Impact of PAC and polymers (polyDADMAC and other alternatives) on NDMA formation in chloraminated water” AWWA Annual Conference, June (2017)
107. Garcia-Segura, S., Tugaoen, H., Hristovski, Westerhoff, P. “Electrochemical Advanced Oxidation Processes: environmental friendly technologies to remove contaminants of emerging concern from wastewater”, AZ Water Annual Conference, May, Phoenix, AZ (2016)
108. Sinha, S., Morrissey, M., Zimmerman, S., Perrault, F., Westerhoff, P. “The Effect of In-Situ Silver Nanoparticle Coating Onto UF and RO Membranes for Biofouling Control to Water Permeability”, Membrane Technology Conference, Phoenix, AZ (2017)
109. Gracia-Sergura, S., Tugaoen, H., Hristovski, K., Westerhoff, P. “Electrochemical Advanced Oxidation Processes”, AZ Water Association Annual Meeting, Phoenix, AZ May 4 (2017)
110. Bi, X. and Westerhoff, P., Issue of interchangeable use of reactivity assessment assays for nanoparticle colloids in liquid solution, 253rd American Chemical Society National Meeting & Exposition, San Francisco, California, 2017.04.
111. Hanigan, D., Ferrer, I., Thurman, E. M., Roback, S., Ishida, K., Plumlee, M., Westerhoff, P. NDMA Precursor Transformation and Identification during Reverse Osmosis and UV/Peroxide Water Treatment for Indirect Potable Reuse. American Chemical Society National Meeting, San Francisco, CA. April 03, 2017.
112. Stancl, H., Ling., L., Kim., J., Westerhoff., P.K., Hristovski, K.D., Fiber Optics as a Fixed-Film Substrate for Photocatalysis via UV-LED Irradiation. 252 American Chemical Society National Meeting, Philadelphia, August 21-25, 2016
113. Krasner, S.W., Lee, T., Westerhoff, P., Fischer, N., Karanfil, T., Beita-Sandi, W., Taylor-Edmonds, L. “Impact of GAC on Regulated and Emerging DBPs and Toxicity”, AWWA ACE, Chicago, IL (June 2016)
114. Fischer, N., Gosh, A., Lyons, G., Westerhoff, P., Seidel, C., “Effect Of Pre-Chlorination On The Use Of Granular Activated Carbon To Control Disinfection Byproducts” , AWWA ACE, Chicago, IL (June 2016)
115. Westerhoff, P., Hanigan, D., Herckes, P., Zhang, J., Andrews, S., Zhao, Y., Thurman, M., Ferrer, I., Bukhari, Z., “Relative importance and contribution of anthropogenic & natural sources of nitrosamine precursors”, AWWA ACE, Chicago, IL (June 2016)
116. Westerhoff, P. and Rice, J. “Comparison of National De Facto Reuse Projected Water Quality versus Direct Potable Reuse Water Quality Goals”, International Symposium: Potable Reuse, January 25-27, Long Beach, California (2016)
117. Stancl, H., Hristovski, K., Westerhoff, P. “Emerging Technology for Small Systems Drinking Water Treatment: Nitrate” AZ Water Annual Conference, Glendale, May (2016)
118. Kidd, J., Hanigan, D., Westerhoff “Removal of Multi-Walled Carbon Nanotubes in Wastewater Treatment due to Association with Sludge” AZ Water Annual Conference, Glendale, May (2016)
119. Fischer, N. and Westerhoff, P. “Pre-chlorination and granular activated carbon as a strategy to reduce formation of total trihalomethanes (TTHM) and haloacetic acids (HAA5)”, AZ Water Annual Conference, Glendale, May (2016)
120. Hoogesteijn von Reitzenstein and Westerhoff P. “Nano-Enabled Polymer Hybridized Mats for Water Treatment Systems”, AZ Water Annual Conference, Glendale, May (2016)
121. Westerhoff, P., Schoepf, Kidd, J., Bi, Y., Herckes, P., Hristovski, K., “Comparison between Chemicals and Nanomaterials: Characterization of Pristine and Transformed Nanoparticles from Foods and Personal Care Products”, ICEENN, Golden, CO, August (2016)
122. Schoepf, J., Bi, Y., Kidd, J., Herckes, P., Hristovski, K., Westerhoff, P. “Detection and Dissolution of Needle-like Hydroxyapatite Nanomaterials in Infant Formula”, Sustainable Nanotechnology Organization annual conference, November (2016)
123. Bi, X. and Westerhoff, P. “Adsorption of III/V Ions to Industrial Nanoparticles Used in Chemical Mechanical Polishing (CMP) Process”, TECHCON, August (2016)
124. Stancl, H., Hristovski, K., Westerhoff, P. “UV-LED Small Systems Drinking Water Treatment”, IOA-UV Annual Conference, February (2016)
125. Nosaka, T., Westerhoff, P., Herckes, P. "Quantification of carbonaceous nanomaterials in complex matrices" National American Chemical Society 251th spring meeting. San Diego, CA. March 2016
126. Fischer, N., Apul, O., Hristovski, K., Westerhoff, P., Nowack, K. “In Situe Regeneration of Granular Activated Carbon Saturated with Natural Organic Matter and Micropollutants”, AWWA-WQTC Annual Conference, Salt Lake City, Utah, November 15-19 (2015)
127. Hanigan, D., Westerhoff, P., Petit, A., Zeng, T., Mitch, W. “ Total Nitrosamines in Wastewaters, Surface Waters, and Foodstuffs by TONO and TONO-HPLC”, AWWA-WQTC Annual Conference, Salt Lake City, Utah, November 15-19 (2015)
128. Mulchandani, A., Hristovski, K., Herckes, P., Westerhoff, P. Characterization, Valuation and Recovery Opportunities of Metals in Municipal Sludges from U.S. Wastewater Treatment Plants. Sustainable Nanotechnology Organization Conference, Portland, OR, November 7-10, 2015.
129. Bi, X., Westerhoff, P.; Complexation of III/V ions to nanoparticles involved in chemical mechanical polishing(CMP) process, Sustainable Nanotechnology Organization (SNO) 2015 Conference, Portland, OR, November 7-10, 2015.
130. Hoogesteijn von Reitzenstein, N., Westerhoff, P. Electrospun Polymer-supported Nanocomposites for Water T reatment. Sustainable Nanotechnology Organization Conference, Portland, OR, November 7-10, 2015.
131. Gifford, M., Westerhoff, P., Chester, M., Hristovski, K. Sustainable Drinking Water Treatment: Life Cycle Assessment Improves Metal Nanoparticle Embedded Anion Exchange Sorbents. Sustainable Nanotechnology Organization Conference, Portland OR. November 10, 2015.
132. Yu Yang, James J. Faust, Jared Schoepf, Kiril Hristovski, David G. Capco, Paul Westerhoff, Pierre Herckes“A Life Cycle Perspective on the Characterization, Occurrence and Effects of Food-grade Nano Silicon Dioxide”, ACS Meeting, Denver, CO March(2015)
133. Lei, T.L., Liang, X., Marcaro, G., Luo, W., White, D., Westerhoff, P., Maciejeski, R. “An Interactive Web-Based Geovisual Analytics Tool to Explore Water Scarcity in Niger River Basin”, Workshop on Visualization in Environmental Science (EnvirVis), The Eurographics Association, *Short Paper (Eds. A. Middel and G.H. Weber*), 5 pages, May 25-29, Cagliari, Italy (2015)
134. Stancl, H., Doudrick, K., Robinson, J., Westerhoff, P., Hristovski K. Nano-Coated Fiber Optics for Photocatalytic Drinking Water Treatment, 250 American Chemical Society National Meeting, Boston, August 17, 2015.
135. Reed, R., Marco, M., Zaikova, T., Hutchison, J., Ranville, J., Tanguay, R., Westerhoff, P., Hristovski K. Evaluation of silver nanoparticle – impregnated textiles across their life cycle, 250 American Chemical Society National Meeting, Boston, August 20, 2015.
136. Gifford, M., Westerhoff, P., Chester, M., Hristovski, K. "Sustainability Impacts for Treatment Technology Selection: Using Life Cycle Assessment to Compare Hybrid Sorbents" AZ Water Association Annual Conference and Exhibition. May 7, 2015. Glendale, AZ.
137. Stancl, H., Hristovski, K., Westerhoff, P., “Light-enabled nitrate removal to nitrogen gases” AZ Water 88th Annual Conference, May 6-8, Glendale, AZ (2015)
138. Westerhoff, P. and Rice, J. “Modeling occurrence and assessing public perceptions of De Facto Reuse”, AWWA Sustainable Water Management Conference, March 15-18, Portland, OR (2015)
139. Doudrick, K., Nosaka, T., Herckes, P., Westerhoff, P. “Quantification of Graphene and Graphene Oxide in Complex Organic Matrices”, Sustainable Nanotechnology Organization (SNO), Annual Conference, Boston, MA, Nov 2-4 (2014)
140. Von Reitzenstein, N., Westerhoff, P. “Effect of indium oxide nanoparticles on electrospun polyvinylpyrrolidone fiber”, POSTER, Sustainable Nanotechnology Organization (SNO), Annual Conference, Boston, MA, Nov 2-4 (2014)
141. Stancl, H., Westerhoff, P., Hristovski, K., “Light-mediated processes for drinking water contaminant reduction employing nano-catalysts”, POSTER, Sustainable Nanotechnology Organization (SNO), Annual Conference, Boston, MA, Nov 2-4 (2014)
142. Doudrick, K., Faust, J., Capco, D., Westerhoff, P. “A facile method for separating and enriching nano- and micro-particles from TiO2 found in food and pharmaceutical products: Application to in vitro exposure assessment”, POSTER, Sustainable Nanotechnology Organization (SNO), Annual Conference, Boston, MA, Nov 2-4 (2014)
143. Schoepf, J., Reed, R., Yang, Y., Herckes, P., Hristovski, K., Westerhoff, P. “Nano-prospecting in an effluent dominated stream”, Sustainable Nanotechnology Organization (SNO), Annual Conference, Boston, MA, Nov 2-4 (2014)
144. Westerhoff, P., Bi, X, Herckes, P., Hristovski, K., Yang, Y. “Significance and Characterization of Chemical-Mechanical Planarization (CMP) Nanoparticles”, Sustainable Nanotechnology Organization (SNO), Annual Conference, Boston, MA, Nov 2-4 (2014)
145. Reed, R., Simonich, M., Tanguay, R., Zaikova, T., Hutchison, J., Herckes, P., Hristovski, K., Westerhoff, P. “Evaluation of silver nanoparticle – impregnated fabrics across their life cycle” Sustainable Nanotechnology Organization (SNO), Annual Conference, Boston, MA, Nov 2-4 (2014)
146. Westerhoff, P., Yang, Y. Nosaka, T., Doudrick, K., Yu, Z., Herckes, P., Hristovski, K. “Interaction of carbon nanotubes and graphene nanoplatelets with wastewater biomass, 248th ACS Annual Conference, San Francisco, CA, August 10-14, Presentation #78 (2014)
147. Bi, X., and Westerhoff, P., The removal of nanoparticles used in CMP slurries through wastewater treatment processes, Techcon 2014, Austin, Texas, September (2014)
148. Westerhoff, Hanigan, D., Zhang, J., Herckes, P., Shen, E., Andrews, S. “Modeling NDMA formation kinetics in wastewater impacted drinking waters”, 248th ACS Annual Conference, San Francisco, CA, August 10-14 , Presentation #343 (2014)
149. Westerhoff, P., Yang, Y., Reed, R., Doudrick, K., Herckes, P., Hristovski, K. “Experimental methods and analytical techniques to assess nanomaterial release from consumer products into sewer systems”, TEchConnect World Innovation Conference and Expo, June 15-18, Washington, DC (2014)
150. Faust, JJ., Doudrick, K., Yang, Y., Westerhoff, P., Capco, DG. Food grade titanium dioxide disrupts brush border microvilli in vitro independent of sedimentation. Poster presented at: Arizona Imaging and Microanalysis Society, March 20-21; Tempe, AZ. **Voted the Electron Microscopy Sciences Best Poster Award (2014)**
151. Bi, X. and Westerhoff, P. “Fate of nanomaterials used in chemical mechanical polishing (CMP) slurries through wastewater treatment”, 87th Annual Conference (AZ Water), May 7-9, Glendale, AZ (2014)
152. Gifford, J., Westerhoff, P., Kristovski, K., “Hybrid Nano-Metal And Anion Exchange Resins For Simultaneous Treatment Of Hexavalent Chromium And Arsenic”, 87th Annual Conference (AZ Water), May 7-9, Glendale, AZ (2014)
153. Barry, M., Westerhoff, P., Hristovski, K. “Membrane Fouling by Phospholipid-formed Vesicles during Ultrafiltration”, 87th Annual Conference (AZ Water), May 7-9, Glendale, AZ (2014)
154. Stancl, H., Westerhoff, P. “Scaling Up and Managing Removal Selectivity of Drinking Water Contaminants”, 87th Annual Conference (AZ Water), May 7-9, Glendale, AZ (2014)
155. Westerhoff, P., Yang, Y., Reed, R., Doudrick, K., Herckes, P., Hristovski, K. “Experimental methods and analytical techniques to assess nanomaterial release from consumer products into sewer systems”, TechConnect World Innovation Conference and Expo, TU2.033, Washington, DC, June 15-18 (2014)
156. Hanigan, D., Krasner, S., Herckes, P., Westerhoff, P. “Removal of polymer-derived N-nitrosamine precursors by activated carbon”, AWWA Water Quality and Technology Conference, Long Beach, CA, Nov 3-7, electronic proceedings WQ13WED09-02 (2013)
157. Krasner, S., Westerhoff, P., Mitch, W., Skadsen, J., von Gunten, U. “Controlling the formation of nitrosamines during water treatment”, AWWA Water Quality and Technology Conference, Long Beach, CA, Nov 3-7, electronic proceedings WQ13ST06WED09-03 (2013)
158. Aydin, N.Y., Mays, L.W., Westerhoff, P., Schmitt, T. (2013). “Sustainability assessment for urban water distribution system*.” International Water Week Amsterdam Conf.*, November 4 - 8, Oral Presentation, Amsterdam, Netherlands.
159. Westerhoff, P., Barry, M., Rice, J. “Water quality impacts from fires in lower versus upper watersheds of Central Arizona” AWWA Water Quality and Technology Conference, ST06WED, Long Beach, CA, Nov 3-7, (2013)
160. Westerhoff, P., Doudrick, K., Stancl, H., Yang, T. “Photocatalytic reduction of oxo-anions from drinking water”, Advanced oxidation technologies for treatment of water, air and soil (AOTs-19), 19th international conference, Nov 17-21, San Diego, CA (2013)
161. Stancl, H., Doudrick, K., Bi, X., Westerhoff, P. “Cr(VI) removal using UV photocatalytic reactors” IOA-IUVA World Congress, Sept 22-26, Las Vegas, NV (2013)
162. Westerhoff, P. “Using nanotechnology safely for water treatment”, IWA Symposium on Environmental Nanotechnology, April 24-26, Nanjing, China (2013)
163. Westerhoff, P., Yang, Y., Doudrick, K., Herckes, P., Hristovski, K., Faust, J., Capco, D. “Characterization of food grade titanium dioxide”, 2nd Sustainable Nanotechnology Organization Conference, Santa Barbara, CA November 3-5 (2013)
164. Yang, Y., Bi, X., Westerhoff, P., Hristovski, K., McLain, J.E. “Engineered nanomaterials either inhibit or improve biological carbon conversion in soils”, 2nd Sustainable Nanotechnology Organization Conference, Santa Barbara, CA November 3-5 (2013)
165. Aydin, N., Mays, L., Westerhoff, P., Schmitt, T. “Sustainability assessment for urban water distribution systems”, IWA meeting (2013)
166. Gifford, J. and Westerhoff, P. “Simultaneous removal of hexavalent chromium and arsenic by commercially available sorbents”, AWWA Inorganic Contaminants Symposium, Feb 6, Sacramento, CA (2013)
167. Nowack, K. and Westerhoff, P. “In-situ GAC regeneration” AWWA ACE Conference, Denver, CO June (2013)
168. Westerhoff P., Hanigan, D., Zhang, J., Herckes, P., Krasner, S. “Reduction of N-Nitrosodimethylamine formation during chloramination by powder and activated carbon” AWWA WQTC, Toronto, CA, November 4-8 (2012).
169. Chao-An Chiu, Kiril Hristovski, Scott Huling, and Paul Westerhoff, “In-Situ Regeneration of Saturated Granular Activated Carbon by an Iron Oxide Nanocatalyst”,  18th International Conference on Advanced Oxidation Technologies for Treatment of Water, Air and Soil (AOTs-18) Conference, Session "Regeneration of Spent Carbon by Chemical Oxidative Treatment", Jacksonville, Florida, USA (November 12-15, 2012).
170. Westerhoff, P., Doudrick, K., Yang, T. “Photocatalytic nitrate reduction in ion exchange brine using titanium dioxide”, AWWA WQTC, Toronto, CA, November 4-8 (2012).
171. Westerhoff, P., Doudrick, K., Herckes, P. “Detection of carbon nanotubes in environmental and biological matrices using programmed thermal analysis”, ACS Annual Conference, Philadelphia, PA, August 19-23 (2012)
172. Hristovski, K., Wang, Y., Buck, N., Westerhoff, P., McLane, J.E. “Environmental releases of engineered nanomaterials results from biosolids disposal to land and air”, ACS Annual Conference, Philadelphia, PA, August 19-23 (2012)
173. Westerhoff, P., Ranville, J., Herckes, P., Halden, R, Doudrick, K. Lee, S. “Analytical techniques for measurement of carbonaceous nanomaterials in diverse media”, ACS Annual Conference, Philadelphia, PA, August 19-23 (2012)
174. Sharif, F. and Westerhoff, P. “Comparable removal in wetland microcosms of trace organics and engineered nanomaterials from simulated wastewater”, AWWA WQTC, Proceedings Electronically available, Phoenix, AZ, November 13-17 (2011)
175. Gray, E.P., Bruton, T.A., Higgins, C.P., Halden, R.U., Westerhoff, P., Ranville, J.F. “Comparison of Two Nanoparticle Separation Techniques, Asymmetrical Field Flow Fractionation and Hydrodynamic Chromatography Using Gold Particles”, 32nd Annual SETAC North America Meeting, Nov 13-17, Boston, MA (2011)
176. Lee, W. Chen, B., Chio, J. , Westerhoff, P. “Solar photolysis of carbonaceous and nitrogeneous disinfection by-products”, AWWA WQTC, Proceedings Electronically available, Phoenix, AZ, November 13-17 (2011)
177. Rosen,J. Akagi, Y., Richter, A., Westerhoff, P., Chiu, C. “Investigating matric spike recovery challenges for the Bull Run watershed source, Portland, Oregon”, AWWA WQTC, Proceedings Electronically available, Phoenix, AZ, November 13-17 (2011)
178. Dotson, A. Westerhoff, P., Beggs, K. Larsen, M. “Monitoring DOM removal and transformation during drinking water treatment by 3D fluorescence”, AWWA WQTC, Proceedings Electronically available, Phoenix, AZ, November 13-17 (2011)
179. Y. Wang, J. Wang, P. Westerhoff and P. Herckes, Investigation of Cloud Processing of Atmospheric Organic Matter using Size Exclusion Chromatography, AAAR annual meeting 2011, Orlando, FL, October 3-7, **Student poster prize for Y. Wang** (2011).
180. Chio, C. and Westerhoff, P. “Size exclusion chromatography for the characterization of organic matter fractions across drinking water treatment unit processes”, Poster presentation, AWWA WQTC, Proceedings Electronically available, Phoenix, AZ, November 13-17 (2011)
181. Barry, M., Doudrick, K. and Westerhoff, P. “Catalytic ozonation using carbon based catalysts”, AWWA WQTC, Proceedings Electronically available, Phoenix, AZ, November 13-17 (2011)
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# Other Presentations

1. Westerhoff, P. ,“The LAST METER …. How TechnoEconomic Analysis provides unique insight into POU design & research needs” University of Colorado, Environmental Engineering (2021)
2. Cao, S. Sinha, P. Westerhoff, Removing MIB/Geosmin related T&O compounds from some real water with UV/H2O2 (SSEBE Annual Graduate Research Symposium, 19 February 2021)
3. E. Briese, K. Niimi, C. A. Velasco, P. Westerhoff, *Integrating Surface Complexation Modeling, Freundlich Isotherm Generating Models, and Pore Surface Diffusion Modeling: A dynamic modelling approach to obtaining contaminant breakthrough curves* (SSEBE Annual Graduate Research Symposium, Poster Presentation, 19 February 2021)
4. Partho Das\*, Yuqiang Bi, Paul Westerhoff, *Impacts of graphitic nanoparticle on soil respiration and nitrification*, SSEBE Annual Graduate Research Symposium, 19 February 2021, Arizona State University, AZ. ( Poster Presentation)
5. E. Briese, K. Niimi, A. Hjelmstad, A. Mulchandani, J. Zimmermann, C. Muhich, P. Westerhoff, *Integrating Surface Complexation Modeling and Pore Surface Diffusion Modeling to Better predict arsenate and oxo-anion removal in water treatment* (NEWT's Industrial Practitioner Advisory Board Meeting, Poster Presentation, 8 October 2020)
6. Minhazul Islam\*, Paul Westerhoff (2020). Tackling PFAS in public water systems using geospatial predictions [Pitch Competition]
7. Alec B. Nienhauser, Sergi Garcia-Segura, Paul Westerhoff. *Electron Reduction Technologies to Remove Perfluorinated Compounds from Fab Wastewaters.* SRC Webinar. September 2020. [Oral] 2. Alec B. Nienhauser, Sergi Garcia-Segura, Paul Westerhoff. Electron Reduction Technologies to Remove Perfluorinated Compounds from Fab Wastewaters. SRC Annual Meeting. November 2020. [Oral]
8. J. Cao, S. Sinha, P. Westerhoff, Upflow Photoreactor with Recirculation to increase Degradation (NEWT's Industrial Practitioner Advisory Board Meeting, Poster Presentation, 8 October 2020)
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10. Westerhoff, P. “Paul Westerhoff Honored with 2020 AP Black Research Award”, *J. American Water Works Association*, 112:6:10-17 (2020)
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13. C.J. Rose, P. Westerhoff and P Herckes. Chloroform formation from swimming pool disinfection: A significant source of atmospheric chloroform in Phoenix? *17th Annual All Scientists Meeting of the Central Arizona-Phoenix Long-Term Ecological Research Project (CAP LTER)* Scottsdale, AZ, January 16, 2015
14. Hristovski K., Westerhoff P., Brown A., (2014), Small and inexpensive point-of-use treatment systems for simultaneous removal of arsenic and nitrate from groundwater, 2014 Navajo Nation Drinking Water Conference, Scottsdale, AZ., June 27, 2014.
15. Westerhoff, P. “Detection of Engineered Nanomaterials: Semi-Conductor Facilities and Consumer Devices”, SRC/SEMATECH ERC 2012 Annual Site Review Meeting, Tucson, AZ, March 22 (2012).
16. Gifford, M. Westerhoff, P. Simultaneous Removal of Hexavalent Chromium and Arsenic by Commercially Available Sorbents. ASU SSEBE Graduate Student Research Symposium, Tempe AZ, March 7, 2013. (Poster; Student won Second Place Award out of 50 posters)
17. Yang, T., Doudrick, K., Westerhoff, P. “Photocatalytic nitrate reduction in ion exchange brine using titanium dioxide”, 85th AZ Water Annual Conference and Exhibition, Glendale, AZ, May 2-4 (2012)
18. Lee, S., Westerhoff, P., Ranville, J.F. “Single particle-ICP technique for analysis of nanoparticle in effluent of wastewater treatment plant” 85th AZ Water Annual Conference and Exhibition, Glendale, AZ, May 2-4 (2012)
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28. DA Ladner, MM Steele, A Weir, K Hristovski, P Westerhoff, “Nanoparticle rejection by micro­ltration and ultra­ltration membranes,” poster presentation, International Conference on the Environmental Implications of Nanotechnology, Los Angeles, CA, May 11-13, 2010.
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37. Westerhoff, P. “Fate of organic chloramines” 2007 Water Quality Center Meeting, Tucson, AZ May 14 (2007)
38. Chen, Z., Herckes, P., Westerhoff, P. „Characterization of Pharmacueticals in Hospital Waste Effluent“,2007 Water Quality Center Meeting, Tucson, AZ May 14 (2007)
39. Westerhoff, P., Zhang, P., Crittenden, J. “Modeling Fluxes of Water and Salt through the Urban Infrastructure” 9th Annual CAP LTER Symposium, January 10 (2007).
40. Westerhoff, P. “Regional water quality monitoring and evaluation for the metropolitan-Phoenix area water supply”, NSF Arizona Water Quality Center, Tucson, AZ, May 10-11 (2004).
41. Westerhoff, P. “Contribution of Wastewater Effluents to Drinking Water Treatment Plants: *Not Everyone Lives Upstream”,* Safe Drinking Water: Where Science Meets Policy, University of North Carolina, March 17 (2006)
42. Westerhoff, P. “Survey of Drinking Water Quality at >4oo Public Taps in Eight Mexican States*”,* Safe Drinking Water: Where Science Meets Policy, University of North Carolina, March 17 (2006)

# “Detection of low molecular weight analytes with high-resolution differential Surface Plasmon Resonance Sensor” Erica Forzani, K. Foely, A. Baumgardner, P. Westerhoff, N. Tao (2005), Federation of Analytical Chemistry and Spectroscopy Societies annual conference, Surface Plasma Resonance Symposium

1. “Removing T&O compounds using ozone oxidation”, P. Westerhoff, B. Nair, P. Pei, WESTCAPs West Valley Water Conference, May 16, Glendale, AZ – no proceedings (2003)
2. “Arsenic occurrence in metro-phoenix groundwater and treatment by GFH Iron”, D. Highfield, P. Westerhoff, D. Bruce, AWPCA 2001 Arizona Environmental Students University Forum, Tempe, AZ (2001).
3. “Comparison of reaction kinetics between chlorine and bromine with NOM”, P-F Chao, P. Westerhoff, X-W Wang, AWPCA 2001 Arizona Environmental Students University Forum, Tempe, AZ (2001).
4. “Inorganic by-products of ozone and chlorine dioxide application to CAP water for cryptosporidium inactivation”, P-F Chao, P. Westerhoff, POSTER at AWPCA 2001 Arizona Environmental Students University Forum, Tempe, AZ (2001).
5. “Change of organic carbon composition during membrane treatment and soil aquifer treatment”, A. Soellner, P. Westerhoff, P. Fox, POSTER at AWPCA 2001 Arizona Environmental Students University Forum, Tempe, AZ (2001).
6. “Formation of DBPs in CAP water and fate during ASR”, L. Jixia, P. Westerhoff, H. Mash, POSTER at AWPCA 2001 Arizona Environmental Students University Forum, Tempe, AZ (2001).

PUBLICATIONS

Other Publications

1. Thomson, P., J. Stoler, A. Wutich, P. Westerhoff, Eds. (2024) Special issue: “Modular, Adaptive, and Decentralized Water.” *Water Security*. <https://www.sciencedirect.com/journal/water-security/special-issues>
2. Engineering Research Visioning Alliance. Engineered Systems for Water Security: A Visioning Report. Columbia, SC: SSRN. dx.doi.org/10.2139/ssrn.4446885. Westerhoff was 1 of 10 Task Force Members instrumental in framing and facilitating the workshop conversations, 36 pages (2023)
3. Jennifer Field, Frederic Leusch, Greg Lowry, Margaret Mills, Paul Westerhoff, Peng Wang, Julie Beth Zimmerman (ES&T Best Papers of 2020), ES&T, 55:17:11489-11490 (2021)
4. Zimmerman, J.; Field, J.; Leusch, F.; Lowry, G. V.; Wang, P.; Westerhoff, P., Impact Beyond Impact Factor. Environmental Science & Technology 2022, 56, (17), 11909-11909.
5. Zimmerman, J. B.; Westerhoff, P.; Field, J.; Lowry, G., Evolving Today to Best Serve Tomorrow. Environmental Science & Technology 2020, 54, (10), 5923-5924.
6. Westerhoff, P.; Zimmerman, J. B.; Field, J.; Lowry, G., Making Waves. Environmental Science & Technology 2020, 54, (11), 6449-6450.
7. Lowry, G.; Field, J.; Westerhoff, P.; Zimmerman, J.; Alvarez, P.; Boehm, A.; Crittenden, J.; Dachs, J.; Diamond, M.; Eckelman, M.; Gardea-Torresdey, J.; Giammar, D.; Hofstetter, T.; Hornbuckle, K.; Jiang, G. B.; Li, X. D.; Leusch, F.; Mihelcic, J.; Miller, S.; Pruden, A.; Raskin, L.; Richardson, S.; Scheringer, M.; Schlenk, D.; Strathmann, T.; Tao, S.; Waite, T. D.; Wang, P.; Wang, S. X., Why Was My Paper Rejected without Review? Environmental Science & Technology 2020, 54, (19), 11641-11644.
8. He, C., Westerhoff, P., Wang, J., Carpenter, G. “Reshaping inland concentrate management using pretreatment and electrodialysis reversal”, *J. American Water Works Association*, 106:2:64-67 (2014)
9. Tiede, K., Westerhoff, P., Foss Hansen, S., Fern, G.J., Hankin, S.M., Aitken, R.J., Chaudry, Q., Boxall, ABA, “Review of the Risks Posed to Drinking Water By Man-made Nanoparticles, Food and Environment Research Agency, Sand Hutton, York, United Kingdom, Report #: DWI 70/2/246, 170 pages (2012)
10. Westerhoff, P. and Doudrick, K., Treatment Technologies for Today and Tomorrow, *Southwest Hydrology*, 8:4:30-31;37 (2009).

1. Westerhoff, P., Rittmann, B. Tiny Particles Causing Big Concern, *Water Environment Research*, 80:6:483-483 (2008)
2. Itoh S, von Gunten U, Westerhoff, P., Preface of a SPECIAL ISSUE, J. of Water Supply Research and Technology – AQUA, 57:6:CP2-CP2 (2008)
3. Final Program Report for AWI Grant 07-18: Comparison of Estrogenic Compound Removal Efficiency from POTWs across Arizona, Principal Investigators: Catherine Propper (NAU), Timothy Vail (NAU), Jani Ingram (NAU), Martin Karpiscak (U of A), Eduardo Saez (U of A), Paul Westerhoff (ASU), and Pat Adler (ADHS).
4. “Chemistry and Treatment of Disinfection By-Products in Drinking Water”, P. Westerhoff, *Southwest Hydrology*, Nov/Dec, 5:6:20-22 (2006).

# “Removal of Endocrine disruptors, pharmaceuticals, and personal care products during water treatment”, P. Westerhoff, *Southwest Hydrology*, Nov/Dec, 2:6:18-19 (2003).

# “Occurrence And Treatment Of Algae-Related Taste And Odor Metabolites In Arizona Reservoirs And Urban Canals” Mario Esparza, Paul Westerhoff, Milton Sommerfeld, Larry Baker, Qiang Hu, Tom Dempster, Mari Rodriguez, Samanth Dawson, Kirsten Hintze, MichelleCummings, Marisa Masles. NSF-LTER Poster Session, Tempe, AZ, January 17 (2002).

# “Influence of growth conditions on production and release of the taste and odor compound Geosmin by a cyanobacterium isolated from the Phoenix water supply system”, Q. Hu, M. Sommerfeld, T. Dempster, P. Westerhoff, L. Baker, M-L. Nguyen. NSF-LTER Poster Session, Tempe, AZ, January 17 (2002).

1. “Inorganic by-products of ozone and chlorine dioxide application to CAP water for cryptosporidium inactivation”, P-F Chao, P. Westerhoff, AWPCA University Forum - Poster, Tempe, AZ, March 23 (2001).
2. “Formation of DBPs in CAP water and Fate During Aquifer Storage and Recovery”, L. Jixia, H. Mash, H. Qun, P. Westerhoff, AWPCA University Forum-Poster, Tempe, AZ, March 23 (2001).
3. “Arsenic occurrence in metro-phoenix groundwater and treatment by GFH iron” D. Highfield, D. Bruce, P. Westerhoff, AWPCA University Forum, Tempe, AZ, March 23 (2001).
4. “Comparison of reaction kinetics between chlorine and bromine with NOM”, P-F Chao, X-W Wang, P. Westerhoff, AWPCA University Forum, Tempe, AZ, March 23 (2001).

PUBLICATIONS

Invited Presentations (Before 2021)

1. Westerhoff, P., “Bridging the divide”, AWWA Special AP Black Seminar, August (2020)
2. Westerhoff, P., Kidd, J., Maynar, A., Zimmerman, J. “Opportunities and Challenges to Commercializing Nano-Enabled Technologies”, PanNANO, Brazil, March (2020)
3. Westerhoff, P., Argonne National Lab Materials for Water Panel, October (2020)
4. Westerhoff, P., “A Journey from Nano-Risk to Nano-Solutions in Water Systems”, NNI 20th Anniversary seminar event, December (2020)
5. Westerhoff, P. “Broad Utilization of the Electromagnetic Spectrum To Enable Nanotechnology to Treat Drinking Water”, Vanderbilt University, September (2020)
6. Westerhoff, P., “De Facto Reuse: Are we drinking treated wastewater?, University of British Columbia WesTalk series, August (2020)
7. Westerhoff, P. “Foreseeing Unintentional Water Challenges That Affect Human and Ecosystem Health” NWRI Clarke Prize Lecture, Irvine, CA, October (2019)
8. Westerhoff, P. “Water Information Technology National trends in wastewater reuse (intentional and unplanned reuse)”, University of Houston Seminar Series, February (2019)
9. Westerhoff, P. “Nano Water-Energy Nexus”, NNI meeting, Washington, DC May (2019)
10. Westerhoff, P. “Safe use of nanomaterials for drinking and industrial water purification”, US-Africa nano forum, Johanesburg, South Africa, August (2019)
11. Westerhoff, P. “Perspectives on Smart Water Data”, AZ Water Annual Confernece, Phoenix, AZ, January (2019)
12. Westerhoff, P. “Nano-Enabled Optical Fibers Enhance Photocatalysis and Disinfection”, KAUST, January (2019)
13. Westerhoff, P. “Safe use of nanomaterials for drinking and industrial water purification”, Brown University seminar series, May (2019)
14. Westerhoff, P. “Safe use of nanomaterials for drinking and industrial water purification”, Franhoffer Institute, April (2019)
15. Westerhoff, P. “Nanoparticles in Wastewater: Sources, Detection and Implications”, NACWA, Portland, OR, May (2019)
16. Westerhof, P. “*Water Information Technology* Effects of wastewater discharges on organic pollutants in rivers and drinking water facilities across the USA and Yangtze River Basin, China”, Harbin Graduate Insitute of Technology, Shenzen, China, June (2019)
17. Westerhoff P. “Nanomaterial Detection and Occurrence in Foods: Impact on People and the Environment” INRA, Nantes, France April (2017)
18. Westerhoff, P., “Overcoming Implementation Barriers for Nanotechnology in Drinking Water Treatment” **Keynote speaker**, Univ of North Carolina Recruiting Weekend, Raleigh, NC, March (2017)
19. Westerhoff, P., “Overcoming Implementation Barriers for Nanotechnology in Drinking Water Treatment”, Univ of California – Riverside, CA February (2017)
20. Westerhoff, P., Stancl, H., Hristovski, K. “Overcoming Implementation Barriers for Nanotechnology in Drinking Water Treatment & A Case Study”, **Invited speaker,** IWA Leading Edge Technology, Brazil May (2017)
21. Westerhoff, P. “Characterization and Removal of C-DBPs & N-DBPs Precursors”, **Keynote** speaker, NOM and control of DBPs, Busan Water International Workshop, South Korea, March (2016)
22. Westerhoff, P. “Detecting nanoparticles to assess risks or benefits of Nanotechnology”, Perkin Elmer Workshop, Tempe, AZ , December (2016)
23. Westerhoff, P., Herckes, P., Hristovski, K., Reed, R. “Quantifying Exposures from Nanotized Products While Assessing Product Efficacy Across Their Value Chain” Society of Toxicology annual meeting, New Orleans, March (2016)
24. Westerhoff, P. “Nanosafety”, IOM, Edinburgh, Scottland, February (2016)
25. Westerhoff, P., “**Occurrence, Removal and Regulation of Nanomaterials at Publicly Owned Sewage Treatment Works**” SESHA, Scottsdale, AZ, May (2016)
26. Westerhoff, P. and Rice, J. “**Water Information Technology: Modeling DeFacto Wastewater Reuse Across the USA**”, Texas Tech Seminar speaker, February (2016)
27. Westerhoff, P. “Advanced materials”, Technologies for Americas Water Future: Disruptive Resilence, San Francisco, CA, February (2016)
28. Westerhoff, P. and Rice, J. “A national perspective on river reaches impacted emerging contaminants of wastewater origin”, **keynote** presentation, Emerging Contaminants Summit, Westminster, CO, March (2016)
29. Westerhoff, P. “**Water Information Technology: Modeling DeFacto Wastewater Reuse Across the USA**”, University of North Dakota seminar series, February (2016)
30. Westerhoff, P. “Trends, Challenges and Opportunities for Granular Activated Carbon (GAC) to Remove Regulated & Non-Regulated Pollutants”, AEESP Invited Speaker, AWWA ACE, Chicago, IL (June 2016)
31. Westerhoff, P., Stancl, H., Li, L., Hristovski, K. “Use of light emitting diodes, fiber optics and TiO2 to photochemically oxidize and reduce pollutants in water”, **Keynote presentation**, IWA Nano & Water Specialist Conference, May 16-18, Houston, TX (2016)
32. Westerhoff, P. “Occurrence, Removal and Regulation of Nanomaterials at Publicly Owned Sewage Treatment Works”, **Keynote** Presentation, 38th Annual International High Technology Symposium, Society of Environmental Health and Safety Association, Scottsdale, May 4 (2016)
33. Westerhoff, P. and Rice, J. “A National Perspective on River Reaches Impacted by Emerging Contaminants of Wastewater Origin”, **Closing Keynote Address**, Emerging Contaminants Summit, Westminster, CO March 1-2 (2016).
34. Westerhoff, P. “Advanced Materials: Unlocking Massive Expansion of Cost-Effective Local Clean Water Supply”, Technology for America’s Water Future: Disruptive Resilience, San Francisco, CA, February 29 (2016)
35. Westerhoff, P. “Overview of LCnano and NEWT”, University of North Dakota, Environmental Engineering, February 18, Fargo, ND (2016)
36. Westerhoff, P. and Rice, J. “Water Information Technology: Modeling DeFacto Wastewater Reuse Across the USA”, University of North Dakota Special Environmental Engineering Seminar Series, Feb. 18, Fargo, ND (2016)
37. Westerhoff, P. and Rice, J. “Comparison of National De Facto Reuse Projected Water Quality versus Direct Potable Reuse Water Quality Goals”, AWWA Direct Potable Reuse Conference, Long Beach, CA, Jan 25-27 (2016)
38. Westerhoff, P. “Overview of NanoEnabled Water Treatment Technology ERC”, Jared Professionals Veteran Association monthly meeting, Phoenix, AZ, December 2 (2015)
39. Westerhoff, P. “Big Data for Water”, Carnegie Mellon University, Symposium Series, Pittsburg, PA, September (2015)
40. Westerhoff, P. “Water Information Technology: How much wastewater are you drinking: Modeling Occurrence and Assessing Public Perceptions of De Facto Wastewater Reuse across the USA ”, Washington University – St. Louis, Symposium Series, St. Louis, MO, Feb. 6 (2015)
41. Westerhoff, P. and Rice, J. “Modeling Occurrence and Assessing Public Perceptions of De Facto ”, Gordon Research Conference on Drinking Water Disinfection By-Products, August 9-14, Mount Holyoke College, MA (2015)
42. Westerhoff, P. and Alvarez, P. “Overview of NanoEnabled Water Treatment Technology ERC”, Plenary Lecture, Sustainable Nanotechnology Organization Annual Conference, Portland, OR, Nov 8-10 (2015)
43. Westerhoff, P. and Alvarez, P. “Overview of NanoEnabled Water Treatment Technology ERC”, Presentation and Panelist, NSF Nanoscale Science and Engineering Grantees Conference: Progress in Nanotechnology, December 9-10 (2015)
44. Westerhoff, P., “Nanomaterial Detection & Biomass Interactions within Wastewater Treatment Plants”, UCLA, Implementing Environmentally-Relevant Exposures for Improved Interpretation of Laboratory Toxicology Studies of Manufactured and Engineered Nanomaterials (M&ENMs) , March 19-20, 2015
45. UCLA Campus, California NanoSystems Institute (CNSI) (2015)
46. Westerhoff, P. “The Application of exposure science to the life cycle”, CPSC-QEEN Workshop, Washington DC, July 6-8 (2015)
47. Westerhoff, P., Herckes, P., Nosaka, T., Doudrick, K. “Quantification of carbon nano materials in complex matrices” CPSC-QEEN Workshop, Washington DC, July 6-8 (2015)
48. Westerhoff, P. “Environmentally Sustainable Use of Nanotechnology”, Jade Mountain Forum on Sustainable Environment and Environmental Nano-Technology Conference, National Cheng Kung University, April 27-28, Tainan, Taiwan (2015)
49. Westerhoff, P. and Rice, J. “Water Information Technology: Modeling DeFacto Wastewater Reuse Across the USA”, Yale University, September (2014)
50. Rice, J. and Westerhoff, P. “National Trends – Where DeFacto Reuse is Occurring or Likely to occur and implications for contaminant occurrence”, AWWA Water Quality and Technology Conference, November (2014)
51. Westerhoff, P. and Rice, J. “Latest Developments in evaluating the consequences of POTW effluent on downstream water supplies”, AWWA Water Quality and Technology Conference, November (2014)
52. Westerhoff, P and Rice, J “Modeling Occurrence and Assessing Public Perceptions of De Facto Wastewater Reuse across the United States of America”, Peking University, China, January (2015)
53. Westerhoff, P. and Rice, J “Water Information Technology: *How much wastewater are you drinking: Modeling Occurrence and Assessing Public Perceptions of De Facto Wastewater Reuse across the USA* ” Washington University of St. Louis, February (2015)
54. Westerhoff, P. “Fate of engineered nanomaterials in wastewater biosolids, land application and incineration”, Metropolitan Water Reclamation District of Greater Chicago (MWRD), Chicago, IL, August 22 (2014).
55. Westerhoff, P., “Nanotechnology in Arizona? Risks & Opportunities”, AZ Water Research Workshop, January, Tempe, AZ (2014)
56. Westerhoff, P. “Nitrosamines: Why it has emerged as a new disinfection by-product of concern for drinking water systems”, Northeastern University seminar series, Feb 24 (2014)
57. Westerhoff, P., “Modeling & Implications of upstream wastewater treatment plants on downstream drinking water plants”, May 26, Fudan University, China (2014)
58. Westerhoff, P. “Applications and implications of engineered nanomaterials on water/wastewater treatment plants”, May 27, Harbin Institute of Technology, China (2014)
59. Westerhoff, P., “Modeling & Implications of upstream wastewater treatment plants on downstream drinking water plants”, May 28, Sun-Yet-Sen University, China (2014)
60. Westerhoff, P., “Occurrence and treatment of emerging contaminants in drinking waters: nanoparticles and beyond”, Dublin City University, Dublin, Ireland, April 28 (2014)
61. Westerhoff, P., Herckes, P., Bi, X., Doudrick, K., Ranville, J. “Nanoparticle occurrence and controls in water and wastes”, SESHA 36th annual international high technology ESH symposium and exposition, May 5-9, Scottsdale, AZ (2014)
62. Westerhoff, P., Hanigan, D., Krasner, S., Mitch, W., McCurry, D., Skadsen, J., von Gunten, U. “Controlling the formation of nitrosamines during water treatment”, Water Research Foundation Workshop on Unintended consequences of implementing nitrosamine control strategies, January 23 (2014)
63. Westerhoff, P. and Yang, Y. “Fate of nanomaterials in treated wastewater and the environment: U1R10”, WERF 9th Annual Research Forum, January 28, New Orleans (2014)
64. Westerhoff, P. “A Life Cycle Perspective of Nanomaterials: Monitoring Nanomaterials Across the Urban Water Gradient”, Nanoscale Science Seminar, Department of Physics/Chemistry & Biochemistry, Arizona State University, Nov 4 (2013)
65. Westerhoff, P., Barry, M., Rice, J. “Water Quality impacts from fires in lower versus upper watersheds of central Arizona”, Special Topics: Impacts of wildland fires on water quality: implications for water utilities, AWWA Water Quality and Technology Conference, Long Beach, CA, Nov 3-7 electronic proceedings WQ13ST06WED-02 (2013)
66. Westerhoff, P., Yang, Y., Herckes, P. “A life cycle perspective of nanomaterials: monitoring nanomaterials across the urban water gradient”, Centre de Recherche Public Gabriel Lippmann Institute Conference on nanomaterials, Luxembourg, October 14-18 (2013)
67. Westerhoff, P., Doudrick, K., Yang, T., Stancl, H., Hristovski, K. “Safe use of nanoscale photocatalysts for nitrate and hexavalent chromium removal from drinking water”, IWA Symposium on Environmental Nanotechnology, April 24-27, Nanjing, China (2013)
68. Westerhoff, P., Yang, Y., Doudrick, K., Herckes, P., Hristovski, K., Faust, J., Capco, D. “Considerations for the selection of analytical methods appropriate for nanomaterial characterization and determination in complex matrices”, Advances in the determination of engineered nano-materials in complex matrices and their application to toxicology and regulatory science, Health Canada – Nanolyse-NanoRelease Workshop, Ottawa, Ontario, Canada, September 25-26 (2013)
69. Westerhoff, P. “Trends in Sustainable Engineering Education in the United States”, 10th anniversary for the establishment of Harbin Institute of Technology Shenzhen Graduate School and its Engineering Education Forum, Shenzhen, China, June 6 – includes a honorium and travel (2012)
70. Westerhoff, P. “Occurrence and Control of Engineered Nanomaterials in the Environment” Harbin Institute of Technology Shenzhen Graduate School, June 5 (2012)
71. Westerhoff, P. “Trends in Engineering Implications of Disinfection By-Product Research in the United States”, Sun Yat-Sen University, Guangzhou, China, June 4 (2012)
72. Westerhoff, P. “ Titanium Dioxide Nanomaterials: An Environmental Risk or Opportunity”, Technology & Innovation Forum: Nanotechnology, University of South Florida, March 27 (2012)
73. Westerhoff, P. “Advanced and Emerging regulatory issues and Treatment Technologies for metal and related compound removal: Nanomaterial Focus”, Workshop #201- Advances in Treatment of Metals, and Selenium to Achieve Low Effluent Concentrations, WEFTEC, San Diego, CA, Oct. 16 (2011)
74. Westerhoff, P. “Fate of nanomaterials during wastewater treatment”, International Water Association Specialist Conference on Applications of Nanotechnology in the Water Sector, May 15-18, Ascona, Switzerland (2011)
75. Westerhoff, P. “Nanomaterial exposure from consumer products and harmonized testing”, Gordon Conference on Environmental Nanotechnology, Waterville Valley, NH, May 29-June 3 (2011)
76. Westerhoff, P. “Overview and nanomaterial removal during wastewater treatment”, Presenter and moderator, Moderator for WERF Webinar: Nanotechnology – Friend or Foe for wastewater treatment, June 23 (2010).
77. Westerhoff, P. Emerging contaminants in Arizona Waters – Pharmaceuticals to Nanomaterials, AZ Water Annual Conference, Glendale, AZ, May 7 (2010).
78. Westerhoff, P. Juan E. Tibaquirá, Kiril D. Hristovski, Jonathan D. Posner “A New Water Source: Fuel Cells for Potable Water? Reclaiming Water from Energy Generation Technologies”, AWWA Sustainable Water Management Conference, April 11-13, Albuquerque, NM (2010).
79. Westerhoff, P. Source and environmental fate of engineering nanomaterials, US-Russia Experts meeting on nanotechnology, National Nanotechnology Initiative, April 8-9, Washington, DC (2010).
80. Westerhoff, P. Biogenic and Engineered Nanomaterials. WERFs Future Research Planning Meeting, December 10, Washington, DC (2009)
81. Crittenden, J.C.; Minakata, D.; Li, K.; Westerhoff, P. Overview of Advanced Oxidation Processes (AOPs): Understanding and Improving Process Performance. Potable Reuse for Water Supply Sustainability Critical Today –Essential Tomorrow-. Long Beach, California, November 16-19, 2008.
82. P. Herckes, Z. Chen, T. Benn and P. Westerhoff, Detection and quantification of fullerenes in environmental samples, 42nd ACS – Western Regional Meeting, Las Vegas, Nevada, September 23-27, 2008.
83. Benn, T., Westerhoff, P., Kiser, A., Wang, Y., Hristovski, K., Detection of nanoscale titanium dioxide in wastewater treatment systems, 42nd American Chemical Society Regional Meeting, Las Vegas, NV, Sept. 26, 2008.
84. Westerhoff, P. Pharmaceuticals in Water: Are they there and do we care? Environmental Professionals of Arizona (EPAZ) and Academy of Certified Hazardous Materials Managers (ACHMM) Luncheon Meeting, September 11, Phoenix, AZ (2008)
85. Benn, T., Westerhoff, P., The Transport of Nanomaterials from Consumer Products through Wastewater Treatment into the Environment, Arizona Society of Civil Engineers (AzSCE) Water Resources Technical Committee (WRTC) Meeting, Salt River Project (SRP) facility, Phoenix, AZ, July 17, 2008.
86. Westerhoff, P. Sources of nanomaterials into sewage and their removal during wastewater treatment, KEYNOTE presentation at SETAC, Warsaw, Poland, May 25 (2008)
87. Westerhoff, P., Dotson, A., Chen, B., and Lee, W. Removing dissolved organic nitrogen components during water treatment, IWA Leading Edge Technology (LET2008), Zurich, Switzerland, June 4 (2008).

1. Westerhoff, P. Fate of nanoparticles in the environment, Arizona Hydrologic Society monthly meeting, Tempe, AZ February 12 (2007)
2. J. C. Crittenden, P. Zhang, E. Lyons, K. Li, F. Sharif, T. Benn, P. Westerhoff, Daisuke Minakata “Life Cycle Assessment of Three Water Scenarios: Importation, Reclamation, and Desalination; Effect of Landscape Irrigation on Saving Energy; Comparison of Energy Required for Advanced Oxidation Processes (AOPs)”, EPRI Workshop to assess research opportunities for water use efficiency technologies, November 14-15, Palo Alto, CA (2007)
3. Westerhoff, P., Crittenden, J., Zhang, Y., Chen, Y., Chen, Z., Kiser, A., Benn, T. ”Detection and Fate of Commercial Nanomaterials During Wastewater Treatment / Treatability of Nanomaterials in Water”, WEFTEC Annual Conference, Session 99, October 17, 4 pages (2007)
4. Westerhoff, P., Chen, B., Krasner, S. “Fate and Transport of Wastewater Derived DBPs and DBP Precursors in Rivers and Streams”,WEFTEC Annual Conference, Workshop 112, October 13 (2007)
5. Westerhoff, P., Benn, T., Kiser, A., Zhang, A., Crittenden, J., Chen, Y., Capco, D., Koenemann, B., Rittmann, B., Dotson, A., „Fate of Engineered Nanomaterials During Water & Wastewater Treatment”, ISEA Conference, Durham, NC, October 15 (2007)
6. P. Westerhoff “Nanoparticle Interactions during wastewater and water treatment”, Seminar Title: Nanotechnology: Fate and Transport of Engineered Nanomaterials, NIEHS organized in.org/conf/tio/nano6/), August 16
7. John Crittenden, Yang Zhang, Brian Koeneman, Kiril Hristovski, Paul Westerhoff, Yongsheng Chen, David Capco, Daniel Gerrity, Hodon Ryu, Morteza Abbaszadegan NANOPARTICLES IN WATER ENVIRONMENT: CHARACTERIZATION, REMOVAL, ENVIRONMENTAL APPLICATIONS, BIO-ACCUMULATION, & CYTOTOXICITY, Tsinghua Unversity, Department of Environmental Science and Engineering, August 24 (2007)
8. John Crittenden, Yang Zhang, Brian Koeneman, Kiril Hristovski,Paul Westerhoff, Yongsheng Chen, and David Capco, “Application of Nanotechnology for Adsorption Processes,” Plenary Lecture, International Water Association Leading Edge Technology Conference, Singapore, June 6, 2007.
9. P. Westerhoff “Societial benefits and environmental challenges of bio- and nano-technologies” 20th Anniversary of the Environmental Quality Act and Arizona Department of Environmental Quality: Assessing and Protecting Arizona’s Water Quality, Phoenix, AZ June 5 (2007).
10. P. Westerhoff “Occurrence and treatment of algal metabolites that cause tastes and odors during water treatment”, NSF-USAID-Egyptian Sponsored, The first Egypt-USA workshop on: Innovative treatment technologies for water, wastewater, sludge and other contaminated waters, Cairo, Egypt, May 22-24 (2007)
11. P. Westerhoff “Detection and Fate of Nanomaterials During Water and Wastewater Treatment”, Malcolm Pirnie Inc. Emerging Contaminants Group and Internet presentation, March 20, Phoenix, AZ (2007)
12. P. Westerhoff “Detection and Fate of Nanomaterials During Water and Wastewater Treatment”, Emerging Contaminants Workshop, Maricopa Cooperative Extension Office, Arizona Water Institute, Phoenix, AZ, March 2 (2007)
13. P. Westerhoff, “Organic Matter Characterization and Reaction with Disinfectants”, University of Illinois, Water Campus Seminar, Urbanan-Champaign, January 19 (2007)
14. P. Westerhoff “Nanomaterials: Challenges for Water and Wastewater Treatment”, University of California Riverside, Riverside, CA, November 3 (2006)
15. P. Westerhoff “Early warning monitoring for algae caused taste and odors” Tri-State Annual Conference, Primm, NV Sept 28-30 (2006).
16. P. Westerhoff “Removal of endocrine disrupting, pharmaceutical and personal care produced by drinking water treatment processes”, Mountain West Society of Toxicology, 24th Annual meeting, Scottsdale, AZ, September 7-8 (2006)
17. P. Westerhoff “Rapid Small Scale Column Tests (RSSCT) for Evaluating Arsenic   
    Adsorptive Media” *Workshop on EPA’s Arsenic Removal Demonstration Program: Results and Lessons Learned,* Water Supply and Water Resources Division, National Risk Management Research Laboratory,, Office of Research and Development, and Office of Ground Water and Drinking Water, Office of Water, Cincinnati, OH  August 22-24, 2006
18. J. Crittenden, Y. Zhang, B. Koeneman, K. Hristovski, P. Westerhoff, Y. Chen, D. Capco, D. Gerrity, H. Ryu, M. Abbaszadegan, “Nanoparticles in water environment: characterization, removal, environmental applications, bio-accumulation, and cytotoxicity” Gordon Conference: Environmental Sciences: Water (What impact is our work having on the state of the environment?), June 25-30, Holderness School, Plymouth, NH (2006).
19. Leenheer, J. and Westerhoff, P. „Dissolved Organic Nitrogen Fractionation“, IHSS Meeting, Boston, MA, March (2006).

1. Westerhoff, P. “Emerging contaminants in drinking water”, City of Phoenix/AWPCA, Pretreatment Technology Transfer Meeting, Phoenix, AZ, March 3 (2006).
2. Hristovski, K., Zhang, Y., Koeneman, B., Chen, Y., Westerhoff, P., Capco., D and Crittenden, J., *Potential Roles on Nanotechnology in Sustainability*, Proceedings to NSF Summer Institute on Nano Mechanics and Materials, June 20-23, 2005, Northwestern University.

1. Westerhoff, P. “Arsenic in Drinking Water”, National Academy of Engineering – Japan-America Frontiers of Engineering (JAFOE) Symposium, Nov 3-5, San Jose, California (2005).
2. Westerhoff, P. “Applications for Laboratory Column Tests in Evaluating Arsenic Adsorption Media”, New Mexico Environmental Health Annual Conference: Arsenic Forum (Invited by Malcolm Siegel from Sandia National Laboratories), Albuquerque, New Mexico, November 2 (2005).
3. Westerhoff, P. “Emerging Contaminants: Nitrogenous Disinfection By-Products & Control of Organic Nitrogen”, Virginia AWWA Research Committee Seminar: Emerging Source Water Considerations and Issues, Richmond, VA, October 17 (2005).
4. Westerhoff, P. “Iron impregnated GAC adsorbents for achieving multiple water quality goals (Arsenic removal)”, California-Nevada Section AWWA Annual Conference, Reno, CA, October 10-15 (2005).
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10. Westerhoff, P. “EDC and PhAC Removal in Bench-scale Water Treatment Studies”, AwwaRF Technology Transfer Conference,  *Endocrine Disrupting and Pharmaceutically Active Compounds and Personal Care Products: Where we are now and what lies ahead*, Oakland, CA, May 20 (2004).
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12. Westerhoff, P.“Removal of Endocrine Disruptors, Personal Care Products and Pharmaceuticals By Conventional and Advanced Drinking Water Treatment Processes” USDA Lecture series, Phoenix, AZ, November 17 (2003)
13. Westerhoff, P.“Removal of Endocrine Disruptors, Personal Care Products and Pharmaceuticals By Conventional and Advanced Drinking Water Treatment Processes” Penn State Kappe Lecture series, September 29 (2003)
14. Westerhoff, P.“Removal of Endocrine Disruptors, Personal Care Products and Pharmaceuticals By Conventional and Advanced Drinking Water Treatment Processes” MI-AWWA Section Research & Technical Practices Committee Conference on Emerging Issues in Water Treatment, May 20 (2003)
15. Westerhoff, P., Yoon, Y., Snyder “Removal of Endocrine Disruptors, Personal Care Products and Pharmaceuticals By Conventional and Advanced Drinking Water Treatment Processes” WESTCAS Regional Meeting, Scottsdale, AZ, March 13 (2003)
16. Westerhoff, P., Yoon, Y., Snyder, S. “Removal of EDCs and PPCPs by Conventional and advanced water treatment processes”, Southeastern regional AWWA Technology Transfer Conference, Greenville, SC January 30-31 (2003).
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18. “Design Equations for Scaling Arsenic Removal sorption systems & Arsenic treatment in Scottsdale” P. Westerhoff, NSF UofA/ASU Water Quality Center Spring Meeting, June 10 (2002).
19. “Potable water issues and solutions for metro-phoenix”, P. Westerhoff, USDA Water Conservation Laboratory, Phoenix, AZ, February 25 (2002).
20. “Sources and control of taste and odor causing algal metabolites (MIB / Geosmin)”, P. Westerhoff, AWPCA Luncheon, October 9, Tempe, AZ (2001).
21. “An Arizona Perspective on Emerging Contaminants” P. Westerhoff, AWPCA Annual Conference, May 3-4, Mesa, AZ (2001).
22. “Mechanistic based disinfectant and disinfectant by-product models”, P. Westerhoff, D. Reckhow, G. Amy, Z. Chowdhury, STAR Drinking Water Progress Review Workshop, USEPA, Silver Springs, MA, February 22-23, p.46-47 (2001).
23. “Kinetic-based models for bromate formation in natural waters”, P. Westerhoff, STAR Drinking Water Progress Review Workshop, USEPA, Silver Springs, MA, February 22-23, p.44-45 (2001).
24. “Questions and answer session with expert panel: water treatment for the new millennium”, P. Westerhoff and 5 others (Moderator: Ramesh Narasimhan), AWPCA conference, Mesa, AZ, May (2000)
25. “Low cost strategy to treat and reuse wastewater”, L. Baker and P. Westerhoff, Southwest Center for Environmental Policy Annual meeting, El Paso, TX, November (1999).
26. “Multiple barrier strategy for taste and odor control”, L. Baker, P. Westerhoff, M. Sommerfeld, Presented at the North American Lake Management Society Conference, Session H-4, Reno, Dec. 1-4. (1999).
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28. “Organic Carbon in Arizona: Implications for Municipalities”, Paul Westerhoff and Dave Anning, Arizona Hydrologic Society Meeting, May 12, 1998, Phoenix, AZ.
29. “Modeling Nitrate during Well Pumpage into Canals”, P.Westerhoff, Salt River Project Water Engineers, Phoenix, AZ, Feb. 9, 1998.
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31. “Natural Organic Matter (NOM) Reactivity with Oxidants/Disinfectants: The Role of NOM Properties (Size, Structure, Functionality)”, G. Amy, P. Westerhoff, J. Debroux, G. Aiken, Swiss Research Institute - EAWAG (November, 1996).
32. “Natural Organic Matter (NOM) Reactivity with Oxidants/Disinfectants: The Role of NOM Properties (Size, Structure, Functionality)”, G. Amy, P. Westerhoff, J. Debroux, G. Aiken, University of Karlsruhe, Germany (November, 1996).
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34. “A model for predicting bromide oxidation by ozone and HO radicals to bromate and the potential role for ozone in treating Arizona Surface water”, P. Westerhoff, Quentin Mees Research Award Presentation and paper for the Arizona Water and Pollution Control Association 70th Annual Conference, Yuma, AZ, May 8 (1997).

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2. Westerhoff, P., Herckes, P., Fischer, N., Donovan, S., Atkinson, A., Cornwell, D., Brown, R., Kommineni, S., Croue, J-P., Linge, K., Liew, D., Lowe, A. “Understanding the Source and Fate of Polymer-Derived Nitrosamine Precursors”, Report #4622, Water Research Foundation, Denver, CO, 174 pages (2019)
3. Seidel, Cl., Ghosh, A., Townsend, E., Westerhoff, P., Fischer, N., Talabi, B., Lyons, G., Zappa, L., Ryan, K., Influence of Pre-oxidation Prior to GAC Treatment in Controlling DBPs (Project #4607 ), Water Research Foundation (2018)
4. Kidd, J.M. and Westerhoff, P. “Chapter 6: Physicochemical Properties and Their Importance in the Environment: Current Trends in Nanomaterial Exposure”, Physico-Chemical Properties of Nanomaterials (Eds: R. Pleus and V. Murashov), Pan Stanford Publishing Pte. Ltd., Singapore, pp 211-246 (2018)
5. Song, G., Pandorf, M., Westerhoff, P., Ma, Y. “Carbon Nanomaterial-Based Fertilizers Can Improve Plant Growth”, Chapter 2 in Nanotechnology Applications in the Food Industry (Eds: V. Ravishankar Rai and Jamuna A. Bai), CRC Press, Florida, pp 21-44 (2018)
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7. Paul Westerhoff, J. Posner, K. Hristovski, J. Tibaquirá “Water Recovery From Hydrogen Fuel Cells and Other Energy Production Systems”, Water Research Foundation Final Report #4139, 103 pages (2011)
8. Westerhoff, P., Jang, H, Abbazadegan, M., Absar, A. “Organic Chloramine Formation in Water Distribution Systems and Influence on Nitrification and Disinfection Efficacy, AWWARF Project 4065 Final Report, 122 pages (2010)
9. Gerald E. Speitel Jr., Lynn E. Katz, Chia-Chen Chen, Shannon Stokes, Paul Westerhoff and Pedram Shafieian “Surface Complexation and Dynamic Transport Modeling of Arsenic Removal on Adsorptive Media”, Water Research Foundation Final Report #3098, 166 pages (2009)
10. Paul Westerhoff, Hyunyoung Jang, Morteza Abbaszadegan, and Alum Absar, Organic Chloramines Formation in Water Distribution Systems and Influence on Disinfection Efficacy and Nitrification, Water Research Foundation #4065 (2009)
11. Disinfection By-Products in Drinking Water: Occurrence, Formation, Health Effects and Control, ACS Symposium Series 995 Book, Edited by T. Karanfil, S.W. Krasner, P. Westerhoff, Y. Xie, 365 pages (2008)
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17. Tanju Karanfil, Stuart W. Krasner, Paul Westerhoff, Yuefeng Xie (Editors), “Disinfection By-Products in Drinking Water: Occurrence, Formation, Health Effects” American Chemical Society, Symposium Series No. 995, Washington, DC 365 pages (2008)
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20. Westerhoff, P., Crittenden, J., Karanfil, T. “Aerogel & Iron-oxide impregnated granular activated carbon media for arsenic removal”, Final report 3079, AwwaRF, Denver, CO, 93 pp. (2007).
21. Gottler, R., Calles, J., Westerhoff, P. Abbaszadegan, M., “Adressing customer concerns about earthy-must odors and cyanotoxins in tap water”, Draft Final Report, AwwaRF, Denver, CO, 154 pp. (2007)
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26. Westerhoff, P., Reckhow, D., Amy, G., Chowdhury, Z. “Mechanistic-based Disinfectant and Disinfectant By-Product Models”, USEPA Grant #R826831-01-0, 46 pages, Final Report (2002).
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28. Westerhoff, P. and Johnson, P. (2001). A Zero-Valent Iron (Fe0) Packed-Bed Treatment Process, American Water Works Association Research Foundation Final Report #90857, Denver, CO.
29. Westerhoff, Paul, editor (2000). The U.S.-Mexican border environment: Water issues along the U.S.-Mexican border. San Diego: San Diego State University Press.
30. “Ozone Oxidation of Bromide and Natural Organic Matter”, P. Westerhoff. Ph.D. Dissertation, University of Colorado at Boulder, August (1995).
31. “A Study of the Effects of Flocculation on Direct Filtration Performance”, P. Westerhoff. Master Project Thesis, University of Massachusetts, Amherst, January (1991).
32. “Bromate Formation in Water Treatment” G. Amy, R. Minear, P. Westerhoff, R. Song. American Water Works Association Research Foundation Final Technical Report (1995).
33. “Irrigation with Municipal Wastewater: how safe is it?”, H. Bouwer, P. Fox, P. Westerhoff, *Water Environment and Technology Newsletter* (November 1998).
34. “Integrating water management and reuse: causes for concern?” H. Bouwer, P. Fox, P. Westerhoff and J. Drewes, *Water Quality International*, February (1999), pp. 19-22.
35. “Kinetic-based models for bromate formation in natural waters” Paul Westerhoff, 1998 Drinking Water Progress Review Workshop for the 1995/1998 Science to Achieve Results (STAR) Grants, December 8-9, 1998, page 52.
36. “Mechanistic-based disinfectant and disinfectant by-product models”, Paul Westerhoff, David Reckhow, Gary Amy, and Zaid Chowdhury, 1998 Drinking Water Progress Review Workshop for the 1995/1998 Science to Achieve Results (STAR) Grants, December 8-9, 1998, page 53-54.
37. “Bromate formation under Cryptosporidium inactivation conditions”, K. Ozekin and P. Westerhoff, *Water Quality International* Newsletter, May/June, pg. 16-17 (1998).

**Sponsored Research**

1. Biofilm Inhibition with Germicidal Light Side-emitted from Nano-enabled Flexible Optical Fibers in Water Systems, National Science Foundation (CBET-2224449) (2022-2025)
2. Gates Foundation – Phase 1 and 2 “Autonomous and modular greywater treatment system for in-home sanitary water reuse” (2022-2025)
3. NASA STTR Phase 1: In-situ Resources Production of Hydrogen and Hydrogen Peroxide From Water Using Nano-Enabled Optical Fibers (2023-24)
4. NASA STTR Phase 1, Phase 2, Phase 2E - Side-emitting optical fibers for delivery of UV-C light to Disinfect Key Bacteria in Space Station Water and Conveyance Systems (2021-2025)
5. NSF-STC: Science and Technologies for Phosphorus Sustainability (STEPS) Center (NSF, co-I, CBET 2019435, 2021-2026, $25M)
6. Improved Understanding of Thermal Destruction Technologies For Materials Laden With Per- And Polyfluoroalkyl Substances (SERDP/DOD/EPA/DOE; co-I, ER21-1107, $1.2M, 2021-2024)
7. Investigation of Alternative Management Strategies to Prevent PFAS from Entering Drinking Water Supplies and Wastewater, Project 5082 (Water Research Foundation, ASU PI, $50,000; 2021-2023)
8. GCR: Coevolution of social and physical infrastructure and improved access to clean water in informal water sharing systems (NSF, co-I, $1,500,000, 2020-2025)
9. RAPID: Disinfection and Reuse of Health-Care Worker Facial Masks to Prevent Infection coronavirus disease (NSF, $150,000; PI; 2020-2021)
10. NSF-NEWT Renewal (2020-2025; Co-PI & ASU PI)
11. Water quality analysis for the City of Tempe wellhead treatment evaluation project (Carollo Eng, PI, $5000, 2020)
12. Arsenic research (DeNora, PI, $17,000, 2020)
13. NEWT Non-core project: Roadmap for nano-BDD electrode development (Localized Water Solutions, co-PI, $12,500, 2020-21)
14. Ultraviolet LED Transmitter Array Surface “Virtual” Disinfection evaluation (Galileo Group, $20,000, PI, 2020-21)
15. Discovery and Implementation of Atmospheric Water Extraction Technology for a Renewable Water Supply (PepsiCo, $230,500, co-PI, 2020-21)
16. NNCI: Nanotechnology Collaborative Infrastructure Southwest (NCI-SW) (NSF, $860,000, co-I, 2020-2025)
17. CSA No. 3 - Greenfield Well Arsenic - Rapid Column Testing (Summit County Service Area #3, PI, $8000, 2020-21)
18. Pleasanton Rapid Small Scale Column Tests (RSSCTs) for PFAS Compounds (Carollo Eng, PI, $22,000, 2020-21)
19. Suburban Water System RSSCT (Carollo Eng, PI, $27,000, 2020-21)
20. Advancing water and energy efficiency for food and beverage and aerospace manufacturing through technology and knowledge transfer (USEPA, co-I, $190,000, 2020-2022)
21. Anticipatory Life Cycle Assessment (LCA) of nanomaterials for water treatment (US Army Corps, co-PI, $300,000)
22. Sustainable Nanotechnology in the 2020’s (NSF, $35,000, PI, 2020)
23. NEWT SUPPLEMENT AWARD – INTERN (NSF, $46,000, co-I, 2020)
24. NEWT SEED - Funding Project: Mechanism of ROS Formation by Nanobubbles to Enable Nanobubble Detection and Tunable Delivery of Oxidants (Rice Univ, $36,000, PI, 2020)
25. Nanobubble Project (Molear, $10,000, PI, 2020)
26. Application of graphitic nanoparticles in reducing nitrogen loss from agricultural systems (USDA, co-I, $469,000, 2020-2023)
27. US-Africa Collaborative Research & Education for Nature-Inspired Earth-AbundantElement based Catalytic Models for Nano-Enabled Water Treatment (NSF, PI, 2020-21, $30,000)
28. Electromechanical Interaction of Gold Nanomaterials with Human Cardiac Cells (NSF, co-I, $556,000, 2020-2023)
29. Metals and Metal Mixtures: Cognitive Aging, Remediation and Exposure Sources (MEMCARE) (NIEHS/NIH, $127,000, 2020-2025)
30. Electron Reduction Technologies to Remove H2O2 or Perfluorinated Compounds from Fab Wastewaters (Semi-Conductor Research Corporation, $250,000, PI, 2019-2021)
31. **Role of graphitic nanoparticles in reducing nitrogen loss from soil/plant systems (USDA, $500,000, co-PI, 2020-2023)**
32. Side-Emitting Optical Fibers for Delivery of UV-C Light To Disinfect Key Bacteria in Space Station Water Storage and Conveyance Systems (NASA, $125,000, PI, 2019-2020)
33. Characterization of airborne nanoparticulate matter in semiconductor manufacturing environments (Semi-Conductor Research Corporation, $300,000, Co-PI, 2019-2021)
34. Occurrence survey of bromide and iodide in water supplies - WRF Project #4711 (Water Research Foundation, $300,000 2018-2021)
35. Evaluation of the potential removal of hexavalent chromium at impacted SRP groundwater wells via addition of SnCl2 (Stannous Chloride) (Salt River Project; $51,500; PI; 2017-18)
36. Baseline Carbon Balance and Thermal Stratification Assessment for Cragin (Blue Ridge) Reservoir (Salt River Project; $51,500; PI; 2017-18)
37. Additive augmented microwave treatment (Chevron, $50,000, 2017-18; PI)
38. Nanotoxicology Screening of Next generation CMP particles (Versuum; $40,000, PI; 2017)
39. Adsorption of PFCs to carbon (Ahlstrom; $15,000; 2017; PI)
40. Direct Integrity Challenge Study - A Field Verification Testing for LT2ESWTR Compliance (Purifics, $10k; 2016-17; PI)
41. GOALI: Collaborative Research: Aquatic Fate and Toxicity of III/V Semiconductor Materials in the Presence of Chemical-mechanical Planarization Nanoparticles (NSF; $167,300 (ASU share); ASU PI; 2015-18)
42. Understanding the Source and Fate of Polymer-Derived Nitrosamine Precursors (Water Research Foundation; $350k; 2016-18; PI)
43. Enhanced Bioremediation of Crude-Oil-Impacted Soils through Chemical Oxidation and Surfactants (Chevron; $37,000; 2015-2017; co-PI)
44. Hydrogen Peroxide (H2O2) Percarbonate and Persulfate Salts Iron Activated Hydrogen Peroxide and Sodium PersulfSurfacts and Integration (Chevron; $128,000; 2016-17; PI)
45. Additional funding of SURFOX project to develop dry-percarbonate application protocols and testing Enhanced Bioremediation of Crude-Oil-Impacted Soils through Chemical Oxidation and Surfactants (Chevron; $71,000; 2015-2017; co-PI)
46. CAP3: Urban Sustainability in the Dynamic Environment of Central Arizona USA (NSF; $6.8M; senior investigator; 2010-17)
47. IGERT: Solar Utilization Network (SUN) (NSF; $3M; senior investigator; 2012-18)
48. MRI: Acquisition of Cryo-EM for Southwest Regional Center( NSF, $2.8M; senior investigator; 2015-18)
49. DMUU: DCDC III: Transformational Solutions for Urban Water Sustainability Transit (NSF; $4.5M; 2015-19; senior investigator)
50. Nanosystems Engineering Research Center for Off-Grid Nanotechnology Enabled Water Treatment (NEWT) (NSF; $7M (ASU share), 2015-25; Westerhoff (ASU-PI))
51. Design of Risk-reducing Innovative-Implementable Small-System Knowledge (DeRISK) Center (USEPA; $250k (ASU share); co-PI at ASU)
52. Aquatic fate and toxicity of III/V semiconductor materials in the presence of chemical-mechanical planarization nanoparticles (Semiconductor Research Corporation; $306, 943; Westerhoff is co-PI, 2015-2017)
53. Lifecycle of nanomaterials, Westerhoff (PI), Theis, Plata, Fairbrother, Zimmermann (USEPA, $5,000,000, 2014-2018)
54. Nanoprospecting: An Approach Towards Environmental Monitoring of Engineered Nanomaterials, Westerhoff (PI), Herckes, Hristovski (NSF, CBET [1336542](https://www.fastlane.nsf.gov/researchadmin/viewProposalStatusDetails.do?propId=1336542&performOrg=Arizona%20State%20University), $306,000, 2013-2016)
55. Titanium dioxide nanomaterials in public water bodies – Reactions with simulated bodily fluids and chlorine-based oxidants, Westerhoff (PI), Herckes, Ranville, Wolff (NIST, $15,000, 2013-2014)
56. An evaluation of reduction coagulation microfiltration and strong base anion exchange treatment process optimization for drinking water hexavalent chromium removal Westerhoff(ASU-PI) (subcontract from Arcadis, Prime sponsor: Water Research Foundation, $25,000, 2013-2015)
57. Forecasting and managing economic impact of forest fires on water quality at municipal water treatment plants, Westerhoff (PI) (Salt River Project, $30,000, 2013-2014)
58. Relative Importance and Contribution of Anthropogenic and Natural Sources of Nitrosamine Precursors (#4499), Westerhoff (PI), Andrews, Thurman, Bukhari, Ferrer (Water Research Foundation, $300,000, 2014-2017)
59. 2013 Environmental Nanotechnology GRC, Stove, VT, June 2 - 7, 2013, Westerhoff (NSF CBET1322232), $50,000 (2013)
60. Detection of Engineered Nanomaterials: Semi-Conductor Facilities and Consumer Devices, Westerhoff, Herckes, Ranville (Semiconductor Research Corporation, $300,000, 2012-2014)
61. Sustainable Sorbents and Monitoring Technologies for Small Groundwater Systems, Westerhoff (PI), Hristovski, Dotson (USEPA, RD835175, $600,000, 2012-2015)
62. Photocatalytic reduction of nitrate in water, Westerhoff, Hristovski (National Science Foundation, $299,000, 2011-2015)
63. Controlling the Formation of Nitrosamines During Water Treatment, Project 4370, Krasner (PI), Mitch, Westerhoff (ASU share $100,000; 2012-2014)
64. Constructed Wetlands for Treatment of Organic and Nanomaterial Pollutants, Westerhoff, Herckes, Halden (Water Research Foundation, $250,000, 2010-2013)
65. Fate of Engineered Nanomaterials in Wastewater Biosolids, Land Application, Westerhoff, Hristovski, Halden (Water Environment Research Foundation, $150,000, 2011-2013)
66. Detection of engineered nanomaterials in drinking water, food , commercial products and biological samples (RC2:Nano-GO), Westerhoff, Halden, Herckes, Hristovski (NIH, $1,272,000, 2009-2012)
67. Sources for Municipal Disinfection By-Product Control, Westerhoff (SRP, $39,000, 7/1/09-6/31/-10)
68. Regional Water Quality Monitoring and Evaluation for the Metropolitan-Phoenix Area Water Supply, Westerhoff (City of Tempe, $15,000, 1/1/08 – 12/31/11)
69. Small and inexpensive point of use treatment systems for simultaneous removal of arsenic and nitrate from groundwater, Hristovski, Westerhoff, Brown (Border 2012/EPA, $50,000, 2009-2010)
70. Regional Water Quality Monitoring and Evaluation for the Metropolitan-Phoenix Area Water Supply, Westerhoff (City of Phoenix, $155,000, 2007-2010)
71. Evaluation of inexpensive sorption technologies for arsenic removal from groundwater in the Arizona-Mexico border region, Hristovski, Westerhoff, Edwards (USEPA/SCERP, $55,000, 2008-2010)
72. Investigation of catalytic ozonation for wastewater, Westerhoff (ITT, $40,000, 2010-2012)
73. A New Water Source: Can Fuel Cells Provide Safe & Cost-Effective Potable Water Sources? (AwwaRF, $150,000, 2007-2010)
74. John Crittenden, Nancy Grimm, Subhrajit Guhathakurta, Peter McCartney, Elizabeth Corley, Paul Westerhoff, Peter Fox; Title: “P3 Design: A Decision Support Tool for Sustainable Urban Water Management”; Funding Source: EPA; Award Date: 2004-2005; Award Amount: $10,000.
75. Development of a quartz tuning fork sensor for chloroform, Westerhoff, Tao (Arizona Water Institute, $25,000, 2007)
76. Potable water production using hydrogen fuel cells, Westerhoff, Posner (Arizona Water Institute, $75,000, 2007-2008)
77. Cyanobacteria for generating solar-powered, carbon-neutral and cost-effective biodiesel (Science Foundation Arizona and BP, over $2 million, 2007-2009)
78. Monitoring of Trace-Level Pharmaceuticals and Personal Care Products in Salt River Project Waters, Westerhoff, Herkes (Salt River Project, $35,000, 2007-2008)
79. Development of methods for endocrine disruptors and pharmaceuticals in water, Chorover, Westerhoff, Proper (Arizona Water Institute, $50,000, 2007)
80. Biological Fate & Electron Microscopy Detection of Nanoparticles During Wastewater Treatment; Westerhoff, Rittmann, Alford (USEPA, $399,000, 2006-2010)
81. Pathway Generation and Byproduct Estimation for Chemical Oxidation Processes in Water Treatment, Crittenden, Li, Westerhoff (NSF $280,000; 2006-2009)
82. Organic Chloramine Formation in Water Distribution Systems and Influence on Nitrification and Disinfection Efficacy, Westerhoff, Abbaszadegan (AwwaRF $150,000; 2006-2009)
83. Predicting Organic Carbon and Disinfection ByProduct Precursors in Metro-Phoenix Surface Water Reservoirs, Westerhoff (Salt River Project, $40,000; 2006-2007)
84. Phase II – Arsenic removal using Iron and Titanium Impregnated Activated Carbon, Westerhoff, Crittenden, Karanfil, Sylvester (AwwaRF funding $115,000; 2006-2009)
85. Occurrence and formation of nitrogenous DBPs (Project#3014), Mitch, Westerhoff, Pastor, Krasner, Leenheer (AwwaRF total project $400,000; Westerhoff share $100,000, 2006-2009)
86. Arsenic media tests (multiple private company and consulting firms; over $125,000; 2005-2006)
87. Production, Testing and Selection of HIX Media for Simultaneous Perchlorate and Arsenic Removal, Westerhoff (USEPA/Battelle, $50,000, 2005-2008)
88. Regional taste and odor projects, Cities of Phoenix, Tempe, Peoria, Central Arizona Project (Westerhoff and Sommerfeld (2005-2006; $200,000)
89. Strategies for Controlling and mitigating algal growth within water treatment plants, Malcolm Pirnie, Milton Sommerfeld, Paul Westerhoff (AwwaRF, 2006-2008)
90. Oxidative Destruction of Organics in Membrane Concentrates (WRF-05-010), WateReuse Foundation, Paul Westerhoff and John Crittenden (WateReuse Foundation, 2005-2008)
91. Regeneration and Performance of Solmetex Xnp Resin, Westerhoff (Solmetex, $15,000, 2004-05)
92. Development Of A Molecular Fingerprinting Technique For Detection Of Toxic Cyanobacteria In The Salt River Reservoir Water Supply System, Qiang Hu, Milton Sommerfeld, and Paul Westerhoff (NSF Water Quality Center, $15,000, 2004-05)
93. Regeneration and Performance of Solmetex Xnp Resin, Westerhoff (Solmetex, $15,000, 2004-05)
94. Developing an arsenic sensor, Westerhoff and Tao (Salt River Project $53,000, 2004-05)
95. The role of dissolved organic nitrogen in drinking water chloramination – monochloramine loss and by-product formation, Shang (Hong Kong Univ.) and Westerhoff (Co-PI) (HKUST, 2004-2005)
96. The fate, transport, transformation and toxicity of manufactured nanomaterials in drinking water, Westerhoff (PI), Chen, Crittenden, Capco (USEPA-STAR, $334,000+$120,000 in matching funds, 2004-2007)
97. Arsenic Removal Technologies – Phase I: Aerogel & Iron-Oxide Impregnated Granular Activated Carbon Media, Westerhoff (PI), Coleman, Karnafil, Crittenden (AwwaRF/DOE, $133,000, 2004-2005)
98. Arsenic Removal Technologies – Phase I: Agglomerated Nanoparticle Media, Westerhoff (PI) and Schroder (AwwaRF/DOE, $133,000, 2004-2005)
99. Verification of Mini-Column Arsenic Test, Westerhoff (PI) (Batelle/USEPA, $120,000; 2004-2008)
100. Wastewater Contribution to DBP Formation, S. Krasner, G. Amy, P. Westerhoff, Z. Chowdhury (ASU share is $50,000 of $400,000; AwwaRF 2004-2006)
101. Groundwater Quality in the US-Mexico Border Region: Arsenic Occurrence and Treatment, Westerhoff (PI) and Mata ($75,000, SCERP/USEPA, 2003-04)
102. Using DNA Fingerprints to track MIB/Geosmin-producing cyanobacteria in the SRP water distribution system-II, Salt River Project, Hu, Q., Sommerfeld, M., Westerhoff, P. ($35,000; 2003-2004)
103. Reducing 2-Methylisoborneol (MIB) and Geosmin in the Metropolitan-Phoenix Area Water Supply, City of Phoenix through NSF WQC, Westerhoff (PI) and Sommerfeld ($225,000; 2003-2004)
104. Study of Palo Verde Nuclear Generating Station Evaporation Ponds: Potential for Salinity Management, City of Phoenix, Fox, Westerhoff, Mash ($96,886; 2003-2004)
105. Comparison of pilot and RSSCTs for GFH and E33, NSF Water Quality Center ($7500) (2003)
106. Dissolved organic nitrogen in drinking water and reclaimed waste water, AWWARF, Westerhoff (PI), Mash, Fox, Amy, Croue, Gallard ($170,000) (2002-2004).
107. Water Quality Center Support from City of Tempe for T&O Monitoring, City of Tempe, Westerhoff (PI), Sommerfeld ($23,100) (2002).
108. Development of gene probes for monitoring occurrence and distribution of MIB/Geosmin producing cyanobacteria in SRP water systems-I, Salt River Project, Westerhoff (PI), Hu, Sommerfeld ($35,000) (2002-2003)
109. MIB/Geosmin Monitoring for Summer/Fall 2002, City of Tempe through NSF Water Quality Center ($26,000) (2002)
110. Arsenic Testing Project, Damon S. Williams Associates through NSF Water Quality Center ($25,000) (2002-2004)
111. Design models for sorption-based arsenic treatment systems, NSF Water Quality Center ($15,000) (2001-2002).
112. Powder Activated Carbon Screening for MIB/Geosmin Removal, City of Tempe through NSF Water Quality Center ($4000) (2002)
113. Ozone-enhanced biofiltration for MIB and Geosmin removal, AWWARF, Westerhoff (PI), Chowdhury, Summers ($300,000) (2001-2004)
114. Conventional and Advanced treatment processes for Endocrine Disruptor, Personal Care Products, and Pharmaceuticals, AWWARF, Snyder (PI), Westerhoff, Song, Levine, Long (2001-2004)
115. Customer perception of algal metabolites: perceived (taste and odor) or actual (biotoxin) risk, City of Phoenix / AWWARF (2001-2004; $125,000).
116. Transient arsenic occurrence and wellhead arsenic treatment, Salt River Project (2000-01). Westerhoff ($38,000)
117. Arsenic treatment project, Motorola SPS (2000), Westerhoff ($11,000).
118. Pre-oxidation studies on CAP water, Carollo Engineers / City of Phoenix (2000), Westerhoff ($28,727)
119. Photosynthetic microalgal mass culturing – Phase II+III, Salt River Project/ASU (1999-2000). Westerhoff (PI), Vermaas, and Quang ($35,000+$7,500).
120. Reducing Taste and Odor and Other Algae-related problems for surface water supplies in arid environment (1999-2002), Sommerfeld (PI) and Westerhoff ($1,236,121).
121. Development of a Kinetic DBP Model, USEPA (1998-2000) Westerhoff (PI), Reckhow, Amy, Chowdhury ($344,000).
122. Modeling Bromate formation in the presence of NOM, USEPA (1998-2000). Westerhoff (PI) ($100,000).
123. A Zero-Valent Iron Packed Bed Reactor for Nitrate Removal, AWWARF (1998-2000). Westerhoff (PI) and Johnson ($90,000).
124. Preparing for regional changes in groundwater quality at GRUSP and other recharge projects, Salt River Project (1998-1999). Westerhoff (PI) and Knauth ($33,000).
125. Photosynthetic microalgal mass culturing, Salt River Project/ASU (1998-1999). Westerhoff (PI), Vermaas, and Quang ($35,000).
126. Taste and Odor and DOC Algae-Related Issues in the Verde River System, Salt River Project/Phoenix/Tempe/ Chandler (1997-1998). Baker (PI), Westerhoff, and Sommerfeld ($50,000).
127. Low-cost wastewater treatment processes (1996-1999). Baker (PI), Westerhoff, Fox, Houston, Johnson ($250,000).
128. Investigation of Soil Aquifer Treatment for Sustainable Water Reuse, USEPA (1998-2000). Fox (PI), Houston, Westerhoff ($1,000,000 + $900,000).
129. “Isolation and characterization of organic carbon from CAP water” (Malcolm Pirnie, Inc.) for $2,051 (sole PI in 1997).
130. “Chemical analysis at Gilbert Water Reclamation Site” (Town of Gilbert) for $7,294 (Sole PI in 1997/98).
131. “Algae-related Water Quality Issues in the Verde River Reservoirs” (Salt River Project) for $48,731 (Second PI of 3-investigators in 1997/99)
132. “Source and transport of aquatic organic material in arid systems” (WEAL/ASU) for $9,600 (first PI of 3-investigators in 1996).
133. “Development of a photosynthetic bioreactor and UV-oxidation system for remediating inorganic and organic pollutants” (Project Ingenhousz/ASU) for $70,050 (first PI of 2-investigators in 1997/98/99).
134. “Investigating the effects of metal-salt addition to lime/soda ash softening processes for improved hardness control, cost reduction, and sludge quality at the Coronado Generating Station, St. Johns, AZ” (Salt River Project) for $26,000 (sole PI in 1997/98).
135. “Low-cost strategy for treating wastewater” (USEPA/SCERP) for $135,000 (Second PI of 5-investigators in 1996/97).
136. “Low-cost strategy for treating wastewater” (USEPA/SCERP) for $87,990 (Second PI of 5-investigators in 1997/98).
137. “Linking nitrate models to existing SRP canal hydraulic models to predict water quality impacts of well pumping” for $25,358 (Salt River Project) (first PI of 3-investigators in 1996/97).
138. “Evaluation of Physical-chemical processes in removing chemically distinct fractions of NOM” (ASU) for $6,000 (sole PI in 1996).
139. “Predicting DBPs in the Paris-Area Water Treatment Plants and Distribution System” (confidential client) (Co-PI in 1995/96/97).

Consulting Experience

Malcolm Pirnie Inc., Carollo Inc., CH2M Hill Inc., Crew Consulting, Boyle Consulting, HDR, Layne Christensen, Briliam, DOW Chemical, Solmetex, Severn Trent, US Filter, Siemens Water Technologies Corporation, Metropolitan Water District of Southern California, Amway, National Water Reuse Inst.

Reviewer for Archival Journals

1. Environmental Science and Technology
2. Water Research
3. Ozone Science and Engineering
4. Waste Management Journal
5. Advances in Environmental Research
6. Journal of Air & Waste Management Association
7. Journal of Hydrology
8. Science of the Total Environmental
9. PLoS One
10. Aqua
11. Environmental Science: Nano

Graduate Students Supervised

PhD Students

1. Mario Esparza (Ph.D.) “Organic Carbon in Wastewater Treatment Plants” (2001) - Chairman
2. Peng-Fei Chao (Ph.D.) “ Role of hydroxyl radicals and hypobromous reactions on bromation formation during ozonation” (2002) – Chairman
3. Wen Chen (Ph.D.) “Fluorescence properties of effluent organic matter and role of mineral adsorption in soil aquifer treatment” (2002) – Chairman
4. MyLinh Nyugen (PhD) “Sources and Characteristics of dissolved organic carbon in arid region water supplies” April 2002
5. Anke Sollner (PhD) “SAT vs membranes for DOC removal in Wastewater” (2002)- co-Chairman
6. Baiyang Chen (PhD-expected 2006) “Organic nitrogen in wastewater and wastewater impacted waters”
7. Wontae Lee (PhD 2005) “Occurrence, molecular weight and treatability of dissolved organic nitrogen”
8. Mohammad Baddaruzmann (PhD 2005) Mass transport scaling and the role of silica on arsenic adsorption onto porous iron oxide (hydroxide)
9. Kiril Hristovski “Applications of nanotechnology in environmental engineering: Arsenic Removal” (PhD 2007)
10. Aaron Dotson (PhD) . Structure and treatability of organic nitrogen-enriched drinking water (2008)
11. Hyunyoung (Grace) Jang (PhD). Organic chloramines formation and its disinfection efficacy (2009)
12. Troy Benn (2009) The release of engineered nanomaterials from commercial products
13. Ayla Kiser (2011) Fate of Engineered Nanomaterials in Wastewater Treatment Plants
14. Chao-An Chiu (2012) Organic Matter Occurrence in Arizona and Innovative Treatment by Granular Activated Carbon
15. Kyle Doudrick (2013) Environmentally Responsible Use of Nanomaterials *for the Photocatalytic Reduction of Nitrate in Water*
16. Fariya Sharif – (2013) *Use of Ozonation and Constructed Wetlands to Remove Contaminants of Emerging Concern from Wastewater Effluent*
17. Michelle Barry – (2014) *Overcoming the Impacts of Extreme Weather and Dissolved Organic Matter on the Treatability of Water using Ozone*
18. Jacelyn Rice – (2014) *Modeling Occurrence and Assessing Public Perceptions of De Facto Wastewater Reuse across the USA*
19. David Hannigan – *Identification of N-Nitrosodimethylamine Precursors to Improve Their Control* 2015
20. James Gifford – *Sustainable Drinking Water Treatment: Using Weak Base Anion Exchange Sorbents Embedded With Metal Oxide Nanoparticles to Simultaneously Remove Multiple Oxoanions* 2015
21. Heather Stancl (2017) Photocatalysis for Reductive Transformation of Nitrate and Chromate in Drinking Water
22. Natalia Fisher (2017) *Novel operation of granular activated carbon contactors for removal of disinfection by-product precursors.*
23. Heuidae Lee (2018) *Improving activated carbon performance in point-of-use and municipal processes*
24. Jared Schoepf (2018) *Tiered Approach to Detect Nanomaterials in Food and Environmental Matrices*
25. Natalia Hoogesteijn von Reitzenstein (2018) *Electrospun Polymeric Nanocomposites for Aqueous Inorganic & Organic Pollutant Removal*
26. Xiangyu Bi (2018) *Detection and surface reactivity of engineered nanoparticles in water*
27. Mariana Lanzarini-Lopes (2020) *Visible and Ultraviolet Light Side-Emitting Optical Fibers Enable Water Purification*
28. Anjali Mulchandani (2020) *Thermally Driven Technologies for Atmospheric Water Capture to Provide Decentralized Drinking Water*
29. Justin Kidd (2020) *Environmental, Human Health, and Societal Impacts of Nanosilver and Ionic Silver Used in Industrial and Consumer Products*
30. Omar Abdullah Alrehaili (2021)*System Level and Microfluidic Devices To Lower Energy Requires For Selective Desalination*
31. Naushita Sharma – (2021) *Occurrence and Speciation of Bromine and Iodine in Drinking Water Sources*
32. Juliana Levi – (2023) *Advancing the Technology Readiness of Membrane Catalyst-film Reactors for Nitrate Removal*
33. Rishabh Bansal – (2023) *Flexible nanocomposite electrodes: Synthesis, Characterization, and Electrochemical applications*
34. Zhe Zhao(2023) *Manufacturable and physically flexible UV-C Side-emitting Optical Fibers for Biofilm Mitigation in Pressurized Water Systems*
35. Xiangxing Long – expected 2023
36. Partho Das – expected 2024
37. Emily Briese – expected 2025
38. Minhazul Islam – expected 2025
39. Alireza Farsad – expected 2024
40. Zunhui Lin – expected 2024
41. Nora Shapiro – expected 2025
42. Ken Niimi – expected 2026
43. Claire Cropper – expected 2027

MS Students

1. Jose Gonzalez Rodriguez (2023) *Understanding influence of nanoparticles loading and pore structure on adsorption: A case of study of titanium dioxide nano-impregnated fibers for arsenate removal*
2. Alec Nienhauser (2021) *Catalytic Treatment of Per- and Polyfluoroalkyl Substances (PFAS) in Semiconductor Wastewaters*
3. Jiefei Cao (2021) Photocatalytic Degradation of para-Chlorobenzoic Acid and Perfluorooctanoic Acid Using Titanium Dioxide and Hexagonal Boron Nitride Catalysts under Three Different Treatment Scales
4. Emmy Pruit (2020) *Microwave Initiated Thermal Decomposition of Total Petroleum Hydrocarbons in Sand*
5. Krishishvar Venkatesh (2020) *Adsorption of Perfluoroalkyl Substances from Groundwater Using Pilot and Lab Scale Columns*
6. Naushita Sharma (2019) *Historical and Future Needs for Geospatial Iodide Occurrence and Sources in Surface and Ground Waters of the United States of America*
7. Duong Nguyen (2019) *Removal of Hexavalent Chromium from Groundwater Using Stannous Chloride Reductive Treatment*
8. Ted Flatebo (2018) *Water Quality and Thermal Stratification of Cragin Reservoir: Current and Future Impact of Forest Fires*
9. Madelyn Pandorf (2018) *Impacts of carbon nanoparticles on nutrient uptake, leaching and yield of lettuce (Lactuca sativa)*
10. Sean Zimmerman (2017) *Flux Performance and Silver Leaching From In-Situ Synthesized Silver Nanoparticle Treated Reverse Osmosis Point of Use Membranes*
11. Harsh Ashani (MS) *Use of Granular Activated Carbon and Carbon Block Filters at Municipal and Point of Use Drinking Water Treatment for Removal of Organics* (2017)
12. Dylan Lesan (MS) *Comparative Analysis of Adsorptive Media Treatment for Arsenic at SRP Groundwater Wells* 2015
13. Alexandra Bowen (MS) *Occurrence and Treatment of Hexavalent Chromium and Arsenic in Arizona Municipal and Industrial Waters* 2014
14. James Gifford (MS) December 2012 "Phosphorus Recovery from Microbial Biofuel Residual Using Microwave Peroxide Digestion and Anion Exchange *"*
15. Yifei Wang (MS) May 2012 - Fate of nanomaterials during wastewater treatment
16. Jacelyn Rice (MS) August 2011 “Water Quality and Energy Balance on Salt River Project Reservoirs”
17. Alex Wier (MS) July 2011 – TiO2 Nanomaterials: Human Exposure and Environmental Release
18. Jun Wang (MS) June 2010 - Transformation in Organic Matter and Nitrogenous DBP Precursors   
    across the Urban Water System
19. Chi Chi Choi (MS) May 2009 – Comprehensive water, salt and energy flux modeling
20. HanhPhuc Nguyen (MS) May 2008 – Iron & titanium impregnated granular active carbon for arsenic removal
21. Hye Moon (MSE) December 2007
22. KC Kruger (MS) December 2007 – Formation and novel sensing of trihalomethanes in drinking water
23. Troy Benn (MS) “Assessment of adsorptive media capacity to remove arsenic and co-occurring metals from natural water matrices through rapid small-scale column tests (RSSCTs) - 2006
24. Bo Song (MS) Characterization of soluble microbial products produced by cyanobacteria and wastewater bacteria - 2006
25. Jorge Navarro Aragon (MS) “Drinking water quality in northern Mexico and arsenic treatment with iron impregnated GAC” - 2005
26. Andrew Baumgardner (MS) “Arsenic removal using titanium dioxide aggregated nanoparticle adsorbents” 2005
27. Alby Aguilar (MS) “Inactivation of *Streptomyces Griseus* By Common Water Treatment Disinfectants” 2004-Chairman
28. Darla Gill (MS) “Impacts of Forest Fires on Drinking Water Quality“ 2004 - Chairman
29. Edward Cole (MS) “Salinity Management for Evaporation Ponds at Palo Verde Nuclear Power Project” 2004 -Chairman
30. Peng Pei (MS) “Methylisoborneol (MIB) and Geosmin removal during ozone-biofiltration treatment” (2003)
31. Brijesh Nair Nalinakumari (MS) “MIB and Geosmin Oxidation During Ozonation” (2003)
32. Michelle Cummings (MS) “Evaluation of microcystin enzyme-based analytic techniques and microcystin occurrence in the metro-phoenix, Arizona water supply system” 2002 – chairman
33. Mari Rodriquez (MS) “Factors influencing the occurrence of MIB in three water supply reservoirs” 2002 – chairman
34. David Highfield (MS) “Arsenic occurrence in metro-phoenix groundwater and treatment by granular ferric hydroxide” 2002 – chairman
35. Mohammad Baddaruzmann “Scaling laboratory arsenic removal data for porous adsorbents to the pilot scale” –2002 – chairman
36. Dawson Samanth “The control of periphytic algae growth with fixed surface biocidal products” (2002) – chairman
37. Li Jixia “Arizona surface water quality monitoring and disinfection by-product formation study: kinetics and modeling” (2002) – chairman.
38. Alice Brawley-Chesworth “Fate of 2-Methylisoborneol and Geosmin in Surface Water Treatment Plants" (Fall 2000).
39. Lennie Okano (M.S.) “Carbon dioxide sequestration by photosynthetic algae” (2000) – Chairman
40. He Qun (MS) “Comparison of Empirical and Mechanistic DBP modeling” (2001)-chairman
41. MS Thesis, Sara Jixia, “Arizona Surface Water Disinfection By-products Formation Kinetics, Modeling and Water Quality Monitoring” April 2002
42. MS Thesis, Madhu Reddy, “Application of algal culture technology for carbon dioxide and flue gas emission control”, May 2002
43. Jennifer James (MS) “Nitrate removal by zero valent iron in a packed bed”(2001)-chairman
44. Paul Dahlen (M.S.) “Water quality benefits from recharging in ephemeral channels” (2001) – Chairman
45. Tsatsu Kwame Fiadjoe (MS in Mechanical Engineering) Evaluation of high-voltage, capacitancebased, water treatment technology – committee member
46. Scott Lee (M.S.) “Ozone and bromate formation” (Expected 1999) - Chairman
47. Mike Pinney (M.S.) “Fate and reactivity of organic carbon during water reuse” (December 1998)-Chairman
48. Peng-Fei Chao (M.S.) “Novel approaches for improving lime-softening processes” (December 1998) - Chairman
49. Hari Anandh (M.S.) “Organic Carbon Characterization and Reactivity Towards Halide Oxidation” (January 1997)- Chairman
50. Sheba Hafiz (M.S.) “Impacts of Groundwater Pumping on Water Quality” (December 1997)-Chairman

Graduate Students in Other Departments

1. Jenifer Edmonds (Ph.D.) “Organic Carbon in Arid Watersheds” (Expected 2004) – *committee member*
2. John Schade (Ph.D., Depart. of Zoology) “The Influence of Nutrient Gradients on Nutrient Cycling in a Stream Ecosystem” (2001)- *committee member*
3. Rob Root (MS-Geology 2003) “Arsenic and iron speciation and attenuation in tidally influenced shallow aquifer: reaction and transport mechanisms” committee member

Undergraduate Students Supervised for Research

1. Amanda Hernandez (2010-) Fate of emerging pollutants
2. Bridget Cavanaugh (2008-09) Fate of nanosilver from commercial products
3. Nisheeth Kakarala (2007) Removal of Nanosilver from commercial products by bacteria at wastewater treatment plants
4. Brandy Ruark (2006)Tungstate Removal from Water using Metal(Hydr) Oxide Adsorbants
5. Katherine Jones (2005-2008) Toxicity modeling of emerging pollutants; Synthesis of titanium nanotubes; Removal of hardness and NDMA formation during ion exchange treatment

# Post-doctoral researchers

1. Austin Henke (2021-2023)
2. Baile Wu (2021-2023)
3. Chao Zeng (2018-2022)
4. Ana Sofia DOS SANTOS FAJARDO (2019-21)
5. Ho Jung Rho (2019-2021)
6. Chung-Seop Lee (2019-21)
7. Logan Rand (2019-20)
8. Ariel Atkinson (2017-2019)
9. Yuqiang Bi (2016-2018)
10. David Hanigan (2015-2017)
11. Onur Apul (2015-2018)
12. Robert Reed (2013-2015)
13. Yu Yang (2012-2015)
14. Ting Lie (2014-2015)
15. Sungyun Lee (2010-2013)
16. Wen-Che Hou (2009-2011)
17. Kiril Hristovski (2008-2010)
18. Guixie Song (2008-2010)
19. David Ladner (2009-2010)
20. Seong-Nam Nams (2007- 2008)
21. Zhuo Chen (2006-2007)
22. Naeem Kahn (2005-2006)
23. YoungIl Kim (2003-2005)
24. Heath Mash (2000-2001)
25. Mario Esparza (2001-2005)
26. Darlene Bruce (1999-2001)
27. Yeomin Yoon (2002-2003)

Research Faculty Supervised

1. Mahmut Ersan (2020-2023)
2. Chao Zeng (2022-2023)
3. Yuqiang Bi (2018-2022)
4. Shahnawaz Sinha (2016-)
5. Sergi Garcia-Segura (2018-2020)
6. Amin Mojiri (2024-)

Technicians Employed and co-supervised

Marisa Masles (2003-2018)

Darlene Bruce (2001-2003)

David Lowry (1999-2001)

Graduate Independent Projects Supervised

1. Emmanuel Moussett (summer 2009)Adsorption of nanosilver to sand and soils, University of Poitiers, France
2. Muhammad Tahir Saddique (March – October 2009) “Sorption of ions onto nanostructured nickel oxide” University of Peshawar, Pakistan
3. Thomas Maugin (summer 2008) “Dissolution of metal oxide nanoparticles in water”, University of Poitiers, France
4. Florian Evan (summer 2008) “Analysis of organic matter by size exclusion chromatography with on-line organic carbon detection, University of Poitiers, France
5. Romain Vivant (Summer 2007) “Amino acid analysis on organic matter”, University of Poitiers, France
6. Alice Hillaireau (summer 2006) The removal of harmful and toxic metals from both groundwater and bottled waters
7. Emeline Dhainaut (summer 2006) Organic chloramine yields upon exposure of biofilms to free chlorine
8. Xin Yang (fall 2006) Organic matter characterization, The Hong Kong University of Science and Technology
9. Xiao-Wei Wang (Fall/2001) “Determination of Chlorine and Bromine Reactivity with NOM”, in cooperation with the Technical University of Berlin.
10. Fernando Sarmiento (Fall/1996) “Linking Nitrate Models to Existing Salt River Project Canal Hydraulic Models to Predict Water Quality Impacts of Well Pumping”
11. Mario Esparza (Fall/1996) “Conditional Stability Constants for Copper with XAD-8 and XAD-4 Fractions of NOM”
12. Annette Reese (Spring/Summer/Fall/1997) “Source and transport of aquatic organic material: a comparison between desert and upland watershed streams”
13. Sophie Roggemans (Spring/Summer/1997) “Literature Review on the fate of viruses and bacteria during wastewater reuse with constructed wetlands and ground water recharge”

Synergistic Activities

* Engineering Research Visioning Alliance. Engineered Systems for Water Security: A Visioning Report. Columbia, SC: SSRN. dx.doi.org/10.2139/ssrn.4446885. Westerhoff was 1 of 10 Task Force Members instrumental in framing and facilitating the workshop conversations, 36 pages (2023)
* Advisory board member of  the Institute for Nanotechnology and Water Sustainability (iNanoWS) at UNISA, South Africa ( 2021-)
* NNCI *Nanoscience Earth and Environmental Science Research Community Virtual Workshop*, Goal: Introduce the geoscience community to new advances and opportunities to do research in nanoscience, Role: Organizing committee member, <https://serc.carleton.edu/nnci_spring2021/index.html> May 24-25 (2021)
* NNCI *How can open-access university facilities best support food and nutrition security? Virtual workshop* Goal: aimed at informing and guiding the future of facilities to support food and nutrition security, Role: Planning committee, <https://www.rtnn.ncsu.edu/nano-food-security/> March 9 (2021)
* Accounts of Chemical Research (ACR) Guest Editor of 19 journal papers; also organized ACS COMSCI session of collected journal papers
* NAFKI Keck Foundation Futures Conference Invite, November 2011
* Moderator for WERF Webinar: Nanotechnology – Friend or Foe, June 23, 2010
* Gordon Conference steering committee of the 2011 Gordon Conference on Environmental Nanotechnology (2010-2011)
* WERFs Future Research Planning meeting, speaker and participant, Washington, DC, December (2009)
* WateReuse Foundation Research Planning Meeting, Facilitator and participant, San Diego, CA, December (2009)
* NIEHI / NNI Environment and Metrology Workshop, co-organizer, Washington, DC, October 6-7 (2009)
* EPA Nanomaterial Case Studies Workshop, participant, Durham, NC, September 29-30 (2009)
* ICON Workshop on Nanomaterials in the Environment, participant, Rice University, March 9-10 (2009)
* EPA / FIFRA Science Advisory Panel on Nanosilver, panel member, Washington DC, November 3-6 (2009)
* NSF Workshop “The water environment of cities” Minnesota, January 16-18 (2008)
* Steering committee member for Workshop on Nanotechnology and Water Treatment (NeWT) Workshop, Sponsored by CBEN (Rice University), Houston, TX Feb 25-27 (2007)
* Finalist for the 2006-2007 National Academy of Engineering Grainger Challenge for arsenic treatment in Bangladesh
* Co-organized ACS symposium on disinfection byproducts (March 2007)
* Participant – Gordon Conference on disinfection by-products (2006), S. Hadley, MA
* Participant & speaker in 2005 Japan-American National Academy of Engineering Frontiers of Engineering Symposium, San Jose, CA
* Participant in NSF workshop on Advances in Water Quality (2004); UNC, North Carolina.
* Served as editor of a book with authors from five different universities for the Southwest Center for Environmental Research and Policy (Westerhoff, Paul, editor (2000). The U.S.-Mexican border environment: Water issues along the U.S.-Mexican border. San Diego: San Diego State University Press.)
* Participant on NSF project (Central Arizona Phoenix – Long Term Ecological Research) and an IGERT (Urban Ecology) funded through Arizona State University
* Strong multidisciplinary connections with biology, plant biology, geology, including a multi-year $1.5 Million project (Sommerfeld, Westerhoff, Baker) investigating algae-related issues (Taste and odors and DOC) in three central Arizona watersheds serving as drinking water supplies
* Co-organized session (T30. Role of NOM and Particulate Colloids in Solute Fate and Transport) at Annual Geological Society of America Conference, Salt Lake City, UT, October 20-23 (1997).
* Co-organized session (T30. Role of NOM and Particulate Colloids in Solute Fate and Transport) at Annual Geological Society of America Conference, Salt Lake City, UT, October 20-23 (1997).

Recent Service Activity

2023-2026 Appointed Trustee, AWWA Water Science and Research Division

2020- Associate Editor, *Environmental Science and Technology*

2015- USA Co-Chair of US-EU Exposure Community of Researchers (CoR)

2022- IUVA Biofilm task force (member)

2015- Member, Water Research Foundation DBP Technical Advisory Committee

2020-2023 Executive Editor, *Environmental Science and Technology*

2020-2023 *National Academies of Sciences, Engineering, and Medicine*, member, Committee on Environmental Impact of Currently Marketed Sunscreens and Potential Human Impacts of Changes in Sunscreen Usage

2019 Co-Chair, 2019 Sustainable Nanotechnology Organization Annual Conference

2016-2020 Editorial Advisory Board (EAB) of Environmental Science & Technology, member

2016-2017 PCAST working group member, Science and Technology to Ensure the Safety of the Nation’s Drinking Water, May – December 2016

2015-2016 AWWA International Symposium: Potable Reuse Planning Committee (Jan. 25-27, 2016)

2015-2016 USEPA Science Advisory Board Hydraulic Fracturing Research Advisory Panel

2013-2015 Gordon Conference Chair (Environmental Nanotechnology)

2011-2013 Gordon Conference Vice Chair (Environ. Nanotechnology)

2010-2011 Gordon Conference organizing committee member (Environ. Nanotechnology)

2009-2010 IWA LET2010 Organizing Committee Member

2009- WEF Academic Committee Member

2009-2011 Hong Kong Research Grants Council reviewer

2009-2012 Member, USEPA Science Advisory Board (Environ. Engineering)

2009-2012 Vice Chair, WateReuse Foundation Research Advisory Committee (RAC)

2008-2010 ASCE Department Heads Council Executive Committee – Member and Region 8 representative

2008 Reviewer for Jersey Water Resources Research Institute

2008 Reviewer for National Science Foundation, Israeli Science Foundation

2008 Member of AwwaRF Nano-projects expert panel

2007-2012 Member AwwaRF Expert panel on Pharmaceuticals

2007 ASU selection committee for Graduate Mentoring Awards

2006-2007 Honors Disciplinary Faculty (Barrett, The Honors College, ASU)

2006 CEE Ad Hoc Committee on Program & Tech Fees (Chair)

2002 – 2008 Environmental engineering group coordinator in CEE

2005-2011 AwwaRF/Water Research Foundation Public Affairs Council

2005-2007 AwwaRF Project Advisory Committee Member for Project 3182 (An electrochemical reactor to minimize brominated DBPs: Impact on coagulation and ozonation)

2002-2008 Fulton School of Engineering Research Advisory Committee (member)

2005-2006 CEE Academic Affairs Committee (member)

2004 Search Committee Member

Associate Dean for Research (Fulton School of Engineering)

* 1. Faculty Search Committee Member (3 searches)

Chemical and Materials Engineering Department

1. Invited participant, AwwaRF Arsenic Planning Workshop
2. Invited participant, USEPA Office of Pesticide Protection Planning Workshop, Washington, DC, February 2004
3. Invited participant, NSF Workshop: Advancing the Quality of Water, Chapel Hill, NC March 10-12
4. Chair, Efficient Curriculum Committee

Civil and Environmental Engineering

* 1. Invited member, ASLO Conference Planning Committee (February 2005, Salt Lake City; Session Chair)

1998-2007 AWWA Particulate Committee (member)

1998-2007 AWWA Water Reuse Committee (member)

1997-1999 AWWA Young Professionals Ad Hoc Committee (member, 1997-99)

1998-present AWWA Academic Awards Committee (member)

1997-1998 IOA Advisory Committee for USEPA M/DBP Rule (member)