William Paul Johnson

Professor, Geology and Geophysics

Civil & Environmental Engineering Adjunct Professor

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<https://scholar.google.com/citations?user=C9gB_GgAAAAJ&hl=en&authuser=1>

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**EXPERIENCE**

1995-present University of Utah Professor (since 2007)

 Department of Geology and Geophysics Assoc. Professor (2001-2007)

 Asst. Professor (1995-2001)

1994-1995 University of Arizona at Tucson Research Assoc.

 Department of Hydrology and Water Resources

 Department of Chemical and Environmental Engineering

1993 Water Science, Inc. Consultant

1990-1993 University of Colorado at Boulder Research Assistant

 Civil, Environmental & Architectural Engineering

1986-1990 United States Geological Survey Hydrologist

 Water Resources Division

1984-1986 Dartmouth College Research Assistant

 Department of Earth Sciences Teaching Assistant

**EDUCATION**

1990-1993 Ph.D. in Civil and Environmental Engineering. University of Colorado, Boulder, CO. Dissertation entitled: Facilitated Transport and Enhanced Desorption of Polycyclic Aromatic Hydrocarbons by Natural Organic Matter in Aquifer Sediments.

1984-1986 M.S. degree in Geology. Dartmouth College, Hanover, NH. Thesis entitled: The physical and magnetic polarity stratigraphy of the Bunthang Sequence, Skardu intermontane basin, northern Pakistan.

1980-1983 B.A. degree in Geology. Whitman College, Walla Walla, WA.

**HONORS AND AWARDS**

Outstanding Faculty Research Award, Department of Geology & Geophysics (U of U), 2011

Outstanding Faculty Research Award, Department of Geology & Geophysics (U of U), 2000

**PROFESSIONAL AFFILIATIONS**

Association of Environmental Engineering and Science Professors

American Geophysical Union

American Chemical Society

**RECENT FUNDED PROJECTS (2016-present)**

Rio Tinto LTD, Pastefill Geochemistry, 08/22/2023 to 08/21/2025, ($184,173).

Utah Dept. Natural Resources Contract 240224, Spatial Distribution and Temporal Variability of Groundwater Inflows to Great Salt Lake, 07/01/2023 to 06/30/2024 (co-PI with D. Kip Solomon $124,960).

Utah Dept. of Natural Resources Contract 221919, Examining the impact of phragmites removal on methylmercury concentrations in the sheet flow wetlands of Great Salt Lake, Utah, 07/01/2022 to 06/30/2024, (additional contract in 2023 for total of $27,000).

Jordan River Farmington Bay Water Quality Council, Farmington Bay Groundwater Seepage Study, Contract 2023-03, 05/05/2023 to 12/31/2024, ($30,000).

Geobiology & Low Temperature Geochemistry Program NSF 2229765, EAGER: Mercury and methylmercury isotope tracing in high-dissolved organic matter high-salinity environments, 07/01/2022 to 06/30/2024, (Collaborative with U.S. Geological Survey Mercury Laboratory, UU portion $172,748).

2141193, EAR NSF: Acquisition of Flow Total Internal Reflection Fluorescence Video Microscopy System to Support Investigation of Nano- and Micro-Particle Transport and Surface Interaction, 05/01/2022 to 04/30/2024, ($316,927)

Atmospheric Sciences Program NSF 2043165: Collaborative Research: Development of a Better Understanding of Ambient RM Chemistry, Reactions Forming, and Methods for Measurement, 03/01/2021 to 02/28/2023 (collaborative with U. Nevada Reno, my portion $44,185)

Hydrologic Science Program NSF: Collaborative Research: Predicting Colloid Distribution in Subsurface Granular Media by Resolving Nanoscale Heterogeneity and Continuum-Scale Flow Field Topologic Impacts, collaborative between Johnson ($290,000) and Diogo Bolster Notre Dame U. ($103,000).

NSF Collaborative Research: Development of a Better Understanding of Ambient RM Chemistry, Reactions Forming, and Methods for Measurement, collaborative Johnson ($48,000), Mae Gustin (U. Nevada Reno) and other researchers.

Technical Advisor U.S. Magnesium Superfund Site, Friends of Great Salt Lake from **U.S. Environmental Protection Agency**, 01/01/21 – 12/31/2023, **$41,000**.

DMREF program NSF: Collaborative Research: Interface-promoted Assembly and Disassembly Processes for Rapid Manufacture and Transport of Complex Hybrid Nanomaterials, **National Science Foundation Division of Materials Research program 1629078**, 10/01/2016 – 09/30/2020, collaborative between Johnson at University of Utah (**$320,000**), Karen Wooley Texas A&M University ($552,000), Darrin Pochan/Arthi Jayamaran University of Delaware ($713,00).

Low Temperature RAPID: Role of the deep brine layer in the production of methylmercury in the Great Salt Lake (PI Frank Black Westminster College, co-PI Johnson), **National Science Foundation Low Temperature and Environmental Biogeochemistry Program**, 08/01/16 – 07/31/17, **$42,748** (to Johnson), $56,296 (to Black).

Hydrodynamic and Chemodynamic Frameworks to Understand Future Trajectories of Trace Element Concentrations in Water, Sediment and Ecosystem of Great Salt Lake (PI Johnson with co-PI Jewell), **Utah Department of Natural Resources Division of Forestry Fire and State Lands** 7/1/2018 – 6/30/2019, **$57,090**.

Assessment of Deep Brine Layer Extent and Geochemistry Prior to and After Opening of a New Causeway Bridge, Great Salt Lake, Utah (PI Ryan Rowland U.S. Geological Survey, co-PI Johnson), **Utah Department of Natural Resources Division of Forestry Fire and State Lands**, 07/01/16 – 06/31/18, **$50,000** (to Johnson), ($136,549 to Rowland).

Nano- and microparticle transport prediction in subsurface media: The role of heterogeneity and structure, **National Science Foundation Hydrologic Sciences Program 1547533**, 06/2016-05/2019, **$280,000**, sole PI with separate collaborative award to Dr. Markus Hilpert of Johns Hopkins University.

**EDITORIAL BOARDS**

*Environmental Science & Technology Letters*, American Chemical Society, Editorial Advisory Board, Spring 2013 to present

*Frontiers in Water*, Associate Editor, Water Quality Section

**REVIEWER FOR**

Professional Journals:

Biofouling

Colloid & Surfaces

Chemical Geology

Chemosphere

Environmental Engineering Science

Environmental Pollution

Environmental Science & Technology

Environmental Science & Technology Letters

Geochimica et Cosmochimica Acta

Journal of Contaminant Hydrology

Journal of Colloid & Interface Science

Journal of Environmental Engineering

Journal of Environmental Monitoring

Journal of Environmental Quality

Journal of Geophysical Research

Journal of Hydrology

Langmuir

Separation and Purification Technology

Vadose Zone Journal

Water Research

Water Resources Research

Funding agency proposal, panel, and center reviews:

National Science Foundation

Hydrologic Sciences Panel 2008-2011

Chemical, Biological, and Environmental Transport Panel 2010 to present

External reviewer for National Center for Environmental Implications of Nanotechnology (CEINT)

 2009 to present

Department of Energy 1997

American Chemical Society Petroleum Research Fund

**COURSES CREATED AND TAUGHT**

Contaminant Partitioning for Engineers & Scientists

Solute Transport and Subsurface Remediation

Numerical Methods for Engineers and Scientists

Environmental Conflict: Mining and Water Quality in Ecuador, Study Abroad

Geoscience, Public Health and Development in the Himalayas of India

Aqueous Geochemistry for Engineers & Scientists

Architecture of the Earth

**STUDENTS/ASSOCIATES ADVISED (Primary Advisor)**

Post-doctoral associates:

Dr. Huilian Ma, Degree: Chemical Engineering, Subject: New filtration theory for colloid retention under unfavorable conditions.

Ph.D. recipients/candidates:

1. Mr. Luis Ullauri, Degree: Geological Engineering. Anticipated 2027
2. Mr. Samuel Lopez, Degree: Geology candidate. Anticipated 2024
3. Dr. Cesar Ron, Degree: Geological Engineering. Completed 2020, Subject: How nanoscale surface heterogeneity impacts the transport of engineered nanoparticles and pathogens in water-saturated environmental granular media.
4. Dr. Anna Rasmuson, Degree: Geology. Completed 2019, Subject: How pore scale physicochemical heterogeneity impacts pathogen and engineered nanoparticle transport in environmental porous media. Present position: Environmental Consultant, TetraTech.
5. Dr. Shu Yang, Degree: Geology, Completed 2019, Subject: Study of aquatic and trace element chemistry in the Great Salt Lake: response to engineered and hydrologic forcings, and temporal correspondence among brine shrimp and water. Present position: Mom.
6. Dr. Logan Frederick, Degree: Geology, Completed 2018, Subject: Mobilization, source identification, and deposition of trace elements in water and sediment. Present Position: Environmental Consultant with Integral, LLC.
7. Dr. Eddy Pazmino, Degree: Geological Engineering, Completed 2015, Subject: New filtration theory for colloid retention under unfavorable conditions. Present position: Associate Professor of Extractive Metallurgy/Chemical Engineering at Escuela Politecnica Nacionale Ecuador.
8. Dr. Greg Carling, Degree: Geology, Completed 2012, Subject: Mercury and other trace element cycling in the Great Salt Lake Basin. Present position: Professor of Geology at Brigham Young University, Provo, Utah.
9. Dr. Ximena Diaz, Degree: Environmental Engineering, Completed 2008, Subject: Selenium cycling in the Great Salt Lake, Utah. Present position: Professor of Extractive Metallurgy at the National Polytechnic University, Quito, Ecuador.
10. Dr. Xiqing Li, Degree: Environmental Engineering, Completed 2006, Subject: Role of fluid drag and energy barrier on colloid retention. Present position: Professor in Resource and Environmental Science, at Peking University, Beijing, China.
11. Dr. Meiping Tong, Degree: Environmental Engineering, Completed 2007, Subject: Role of pore domain geometry and energy barrier on colloid retention in porous media. Present position: Professor in Environmental Science and Engineering, Peking University, Beijing, China
12. Dr. Pengfei Zhang, Degree: Geological Engineering, Completed 2000, Subject: Immunomagnetic methods for bacterial detection in groundwater and role of fluid velocity and predation on bacterial transport. Present position: Professor at City College of New York, New York.

M.S. recipients/candidates

1. Mr. Ebenezer Adomako, Degree: Geological Engineering, Anticipated 2025
2. Mr. Noah Willis, Degree: Geology, Anticipated 2025
3. Mr. Alex Engstrom, Degree: Geology, Anticipated 2024
4. Mr. Santiago Jurado, Degree: Geological Engineering. Anticipated 2023
5. Mr. Ivan Gaichuk, Degree: Geology, 2023
6. Ms. Hannah Finley, Degree: Geology, 2023
7. Ms. Erin Brinkman, Degree: Geology, 2023
8. Mr. Jacob Wright, Degree: Geology, 2020
9. Ms. Andrea Chica, Degree: Geology, 2019
10. Mr. Kurt VanNess, Degree: Geology, 2019
11. Mr. Brock Erickson, Degree: Geological Engineering, 2019
12. Mr. Bhavneet Singh, Degree: Geology, 2019, Subject: Antibiotic Resistance in Groundwater in Rural India
13. Ms. Carla Valdes, Degree: Geology, 2016, Subject: Mercury and Trace Element Cycling
14. Ms. Logan Frederick, Degree: Geology, 2015, Subject: Nationwide Arsenic and Uranium Risk
15. Mr. Chris Tingey, Degree: Geology, 2015, Subject: Mercury and Trace Element Cycling
16. Mr. Jacob Trauscht, Degree: Geology, 2015, Subject: Colloidal Transport
17. Mr. Brooks Black, Degree: Geology, 2013, Subject: Mercury and Trace Element Cycling
18. Mr. Joel Pierson, Degree: Geology, 2013, Subject: Nutrient Cycling
19. Mr. Neil Swanson, Degree: Geology, 2013, Subject: Mercury and Trace Element Cycling
20. Ms. Eliana Manangon, Degree: Geological Eng., 2012, Subject: Environmental Nanoparticles
21. Mr. Eddy Pazmino, Degree: Geological Engineering, 2011, Subject: Colloid transport
22. Ms. Abigail Rudd, Degree: Geological Engineering, 2010, Subject: Mercury methylation
23. Ms. Kimberley Beisner, Degree: Geology, 2008, Subject: Selenium cycling in the Great Salt Lake
24. Mr. Wade Oliver, Degree: Geology, 2008, Subject: Selenium sedimentation in the Great Salt Lake
25. Ms. Mary Ellen Potter, Degree: Civil Eng., 2008, Subject: Phosphorous accum. in Farmington Bay
26. Ms. Christina Brow, Degree: Environmental Eng., 2004, Subject: Colloid Transport
27. Mr. Michael Koch, Degree: Public Health, 2004, Subject: Cholera detection in ship ballast
28. Ms. Margaret McGriff, Degree: Geology, 2002, Subject: Surfactant solubilization of PCE and PAH
29. Mr. William McIntosh, Degree: Geology, 2002, Subject: Bacterial transport in groundwater
30. Mr. Ryan Rowland, Degree: Geology, 2002, Subject: U treatment in permeable reactive barrier
31. Mr. Gaobin Bao, Degree: Geology, 2000, Subject: Surfactant solubilization of PCE and PAH
32. Mr. Phillip Schmitz, Degree: Geol. Eng., 2000, Subject: Au extraction from carbonaceous ore
33. Mr. Wynn John, Degree: Geol. Eng., 1999, Subject: PAH solubilization by surfactants and NOM
34. Mr. Jorn Stenebraten, Degree: Geol. Eng., 1998, Subject: Au extraction from carbonaceous ore

**SERVICE ACTIVITIES (2016-present)**

* Chair Department of Geology & Geophysics (AY 2023-present)
* Chair of Dual Faculty Search Committee (Environmental and Solid Earth positions) Geology & Geophysics Dept. (AY 2022)
* Chair Curriculum Committee Department of Geology & Geophysics (AY 2018-2021)
* Associate Chair Geology & Geophysics (AY 2016)
* Academic Senate President University of Utah (AY 2016)
* PAC12 Academic Senate President University of Utah (AY 2017)
* Advisory Board member Environmental Science & Technology Letters (2016 to present)
* Associate Editor Frontiers in Water (2016 to present)
* Technical Advisor U.S. Magnesium Corporation Superfund Site on behalf of Friends of Great Salt Lake. Managing graduate student information transfer to community (2016 to present).
* SVPAA Fellow campus-wide conversation regarding graduate research and education (AY 2017).

**INVITED PRESENTATIONS (since 2009)**

Colloid Transport in Porous Media, Civil & Environmental Engineering Department Seminar, The George Washington University, March, 2022.

Contaminant Removal and Precious Metal Recovery by Lateral Channel Filtration in Mining-Impacted Rivers, Brigham Young University Department Geological Sciences, February, 2021.

Contaminant Removal and Precious Metal Recovery by Lateral Channel Filtration in Mining-Impacted Rivers, Clemson University Department of Environmental Engineering and Earth Sciences, September, 2020.

Five lectures delivered on topics related to contaminant fate and transport during October 2019 in departments of environmental science and engineering at Beijing University, Beijing Normal University, Chinese Academy of Sciences Applied Ecology Institute, Shenyang University.

Chemical Engineering Graduate Seminar, January 2019, The Tar Sands of Eastern Utah: What Hydrogeochemical Data Says about Potential Impacts to Water Resources

China, Sun Yat-Sen University, Department of Civil and Environmental Engineering, December 2018, Targeted delivery in porous media: The impact of nanoscale interactions on macroscale transport of nano- and micro-particles Observation and prediction.

Chemical Engineering Graduate Seminar: “Applications of particle transport and surface interaction theory in porous media: why identical particles show “unpredictable” behaviors under environmental and other conditions involving particle-surface repulsion”, April 16, 2018, Department of Chemical Engineering, University of Utah.

Geography Colloquium: “The Tar Sands of Eastern Utah: Intersecting Science, Policy, Student Engagement, and Activism as Experienced from a Hydrogeochemical Perspective”, December 1, 2017, Dept. of Geography, University of Utah.

Invited Speaker: “Roughness Versus Charge Contributions to Representative Discrete Heterogeneity Underlying Mechanistic Prediction of Colloid Attachment, Detachment and Breakthrough-Elution Behavior Under Environmental Conditions”, April 27 2016 in European Geophysical Union session ”Fate and transport of biocolloids and nanoparticles in soil and groundwater systems” .

Grand Rounds: “Environmental Chemodynamics: Mercury in Great Salt Lake, Pathogens in Groundwater, and Mining-impacted Rivers in Ecuador”, November 8th, 2016, Division of Public Health, Department of Family and Preventative Medicine, School of Medicine, University of Utah.

Chemical Engineering Undergraduate Seminar “The Physics, Chemistry, and Topology Behind Particle Transport and Retention in Aqueous Saturated Porous Media”, December 1, 2015, Department of Chemical Engineering, College of Engineering, University of Utah.

Keynote Address: “Mechanistic Quantitative Prediction of Nano- and Micro-Particle Retention in Porous Media: Contaminant Removal during Hyporheic Exchange, Riverbank Filtration, and Other Contexts”: 1st International Conference on All Materials Fluxes in River-Ecosystem (AMFR2015), January 15-18th, 2015, Peking University, Beijing, China.

Session Invited Speaker: “Selenium in the Great Salt Lake, the Dynamics of the Real versus the Regulatory Worlds”: 1st International Conference on All Materials Fluxes in River-Ecosystem (AMFR2015), January 15-18th, 2015, Peking University, Beijing, China.

Invited Speaker: “The Physics, Chemistry, and Topology Behind Particle Transport and Retention in Aqueous Saturated Porous Media: How Natural Water Filtration May Relate to Drug Delivery”: Nanoinstitute & Pharmaceutical Chemistry Combined Seminar, University of Utah, November, 2013.

Session Invited Speaker: Flow of Complex Fluids in Porous Media, at 5th International Conference on Porous Media and the Annual Meeting of International Society for Porous Media (INTERPORE 2013), Talk titled: “Reading the Surface Heterogeneity Responsible for Natural Filtration in Subsurface Porous Media”, Prague, CZ (2013).

Keynote Address, “Pathogens in the subsurface: Predicting Darcy-scale transport from nanoscale processes”, International Conference on Assessing Pathogen Fate, Transport, and Risk in Natural and Engineered Water Treatment, Banff, Alberta, Canada (2012).

Policy at the Podium, Department of Political Science, University of Utah, “Selenium and mercury in the Great Salt Lake: The dynamics of the regulatory world versus the dynamics of the physical world” (2012)

Distinguished Lecture Series, Department of Geology & Geophysics, University of Utah, “Breathing for Trace Element Balance: Situations in which It Does, Does Not, and Might Work in the Great Salt Lake and Transitional Wetlands” (2012)

The Pennsylvania State University Engineering Energy & Environmental Institute (E3I) Fall Graduate Seminar: “New filtration theory for predicting retention of *Cryptosporidium* oocysts and other > 2 micron particles in porous media under environmental conditions” (2011)

The Johns Hopkins University Center for Environmental and Applied Fluid Mechanics Fall Seminar Series: “Progress and challenges in developing theory for prediction of micro- and nano-particle transport in porous media under environmental conditions” (2011)

Utah State University College of Natural Resources Fall Seminar Series: “Ongoing research questions regarding Se and Hg in the Great Salt Lake” (2010)

University of Utah Global Change and Ecosystem Center Fall Seminar Series: “Ongoing research questions regarding Se and Hg in the Great Salt Lake” (2010)

EPA Symposium on Ground Water-borne Infectious Disease Epidemiology, Etiologic Agents and Indicators, Washington D.C. Winter 2010, New filtration theory for predicting retention of *Cryptosporidium* oocysts and other > 2 micron particles in porous media under environmental conditions. (2009)

Panel Presentation at National Nanotechnology Initiative Meeting on Nanomaterials and the Environment & Instrumentation, Metrology, and Analytical Methods, Developing methods to detect nanomaterials and determine exposure routes, Fall, 2009.

**REFEREED PUBLICATIONS (\*corresponding author)**

Google scholar: Total citations: 7910; H-index = 49; i10 index = 104

(<https://scholar.google.com/citations?user=C9gB_GgAAAAJ&hl=en&authuser=1>)

1. Gustin\*, Mae Sexauer; Sarrah M. Dunham-Cheatham; Natalie Allen; Nicole Choma; William Johnson; Sam Lopez; Armistead Russell; Eric Mei; Olivier Magand; Aurélien Dommergue; Tyler Elgiar, **2023**, Observations of the chemistry and concentrations of reactive Hg at locations with different ambient air chemistry, Sci. Tot. Environ., <https://doi.org/10.1016/j.scitotenv.2023.166184>.
2. Xun Guan, Dimin Fan, Lingchen Kong, Chenwei Liu, Bridget Anger, William P. Johnson, Gregory V Lowry, Guangbin Li, Anthony Danko, and Xitong Liu\*, **2023**, Transport and Remobilization of Polymer-Stabilized Colloidal Activated Carbon in Saturated Sand Columns: Implications for in situ Groundwater Remediation, **in revision**
3. Yang, Yulong**\***; Yuan, Weifeng; You, Zhenjiang; Zhang, Juan; Yang, Leilei; Hou, Jirui ; Johnson, William, **2023**, AFM-measured adhesion: explaining trends with temperature and ionic strength, and variance around mean, *Langmuir*, **in revision**.
4. Johnson William P. and Pazmino Eddy F., **2023**, Colloid (Micro- and Nano-Particle) Transport and Surface Interaction in Groundwater, The Groundwater Project, 117 pp., <https://gw-project.org/books/colloid-nano-and-micro-particle-transport-and-surface-interaction-in-groundwater/>. DOI being repaired.
5. Patino Janis E., William P. Johnson, Veronica L. Morales, Relating mechanistic fate with spatial positioning for colloid transport in surface heterogeneous porous media, **2023**, Journal of Colloid and Interface Science, ISSN 0021-9797, <https://doi.org/10.1016/j.jcis.2023.03.005>.
6. Li, Tiantian; Shen, Chongyang**\***; Johnson, William; Ma, Huilian; Jin, Chao; Zhang, Chenxi; Chu, Xianxian; Ma, Ke; Xing, Baoshan, **2022**, Important role of concave surfaces in deposition of colloids under favorable conditions as revealed by microscale visualization, *Environ. Sci. Technol.*, 56, 7, 4121–4131. <https://doi.org/10.1021/acs.est.1c07305>.
7. Yang Liqiong, Kang Jia, Chen Xijuan**\***, Zhuang Jie, Ripp Steven, Johnson William, **2021**, Real-time Bioluminescent Imaging of Spatiotemporal Variation of Microbial Retention during Transport through Porous Media under Variably Saturated Flow Conditions, Journal of Hydrology 601(13):126603, <https://doi.org/10.1016/j.jhydrol.2021.126603>.
8. Yu Congrong**\***, Peiyi Duan, D.A. Barr, William P. Johnson, Li Chen, Zhongbo Yu, Yufeng Sun, Ying Li, **2021**, Colloidal transport and deposition through dense vegetation, Chemosphere 287 (2022) 132197, <https://doi.org/10.1016/j.chemosphere.2021.132197>.
9. Ron C., William P. Johnson\*, **2020**, Complementary Colloid and Collector Nanoscale Heterogeneity Explains Microparticle Retention Under Unfavorable Conditions, *Environ. Sci. Nano*, 7, 4010 – 4021. DOI: <https://doi.org/10.1039/D0EN00815J>.
10. **Johnson William P.\***, Pazmino E., Frederick L., Ron C., Chica A., **2020**, Contaminant removal and precious metal recovery by lateral channel filtration in mining impacted alluvial floodplains, *Frontiers in Water*, 2:586698, <https://doi.org/10.3389/frwa.2020.586698>.
11. Wright Jacob, Shu Yang, **William P. Johnson\***, Frank J. Black, James McVey, Austin Epler, Abigail F. Scott, Madelene P. Trentman, Alexandria R. Martin, Gaurav Pandey, Andrew M. Piskadlo, **2020**, Temporal Correspondence of Selenium and Mercury Among Brine Shrimp and Water in Great Salt Lake, Utah, USA, *Sci. Tot. Environ.*, 749, 141273, <https://doi.org/10.1016/j.scitotenv.2020.141273>.
12. **Johnson W.P.\***, **2020**, Quantitative Linking of Nanoscale Interactions to Continuum-Scale

Nanoparticle and Microplastic Transport in Environmental Granular Media, *Environ. Sci. Technol.* 54, 13, 8032–8042. <https://dx.doi.org/10.1021/acs.est.0c01172>.

1. **Johnson William P.\***, Rasmuson Anna, Brock Erickson, Kurt VanNess, Cesar Ron, Diogo Bolster, Brett Peters, **2020**, Anionic nanoparticle and microplastic non-exponential distributions from source scale

with grain size in environmental granular media, *Water Research*, 182, 116012, <https://doi.org/10.1016/j.watres.2020.116012>.

1. Ma H., Bolster C., **Johnson, W.P.**, Li K., Pazmino E., Camacho K.M., Anselmo A.C., Mitragotri S., **2020**, Coupled influences of particle shape, surface property and flow hydrodynamics on rod-shaped colloid transport in porous media, *J. Colloid & Interface Science*, Volume 577, 1 October 2020, Pages 471-480.
2. Rasmuson Anna , Brock Erickson, Mark Borchardt, Maureen Muldoon, **William P. Johnson\***, **2019**, Pathogen Prevalence in Fractured versus Granular Aquifers and the Role of Forward Flow Stagnation Zones on Pore Scale Delivery to Surfaces, *Environ. Sci. & Technol*., 54, 1, 137-145.
3. Yang Shu, **William P. Johnson**\*, Frank J. Black\*, Ryan Rowland, Christine Rumsey, Andrew Piskadlo, **2019**, Response of density stratification, aquatic chemistry, and methylmercury to engineered and hydrologic forcings in an endorheic lake (Great Salt Lake, U.S.A.), *Limnol. Oceanogr*., 9999, 2019, 1–12.
4. Ron Cesar A., Mei Dong, Karen L. Wooley, William P. Johnson\*, **2019**, Theory-Guided Targeted Delivery of Nano- and Micro-Particles in Advective Environmental Porous Media, *Environ. Sci. Technol. Letters*. 6, 10, 617-623, 10.1021/acs.estlett.9b00474.
5. VanNess Kurt, Anna Rasmuson, Cesar A. Ron, **William P. Johnson**\*, **2019**, A Unified Theory for Colloid Transport: Predicting Attachment and Mobilization under Favorable and Unfavorable Conditions, *Langmuir*, 35 (27), 9061-9070, 10.1021/acs.langmuir.9b00911.
6. Ron Cesar, Kurt VanNess, Anna Rasmuson, **William P. Johnson**\*, **2019**, How Nanoscale Surface Heterogeneity Impacts Transport of Nano- to Micro-Particles on Surfaces under Unfavorable Attachment Conditions, *Environmental Science: Nano*, 6, 1921 - 1931, 10.1039/C9EN00306A.
7. Frederick Logan, **William P. Johnson**\*, Thure Cerling, Diego Fernandez, James VanDerslice, **2019**, Source Identification of Particulate Metals/Metalloids Deposited in the San Juan River Delta of Lake Powell, USA, 230, 128, *Water, Air and Soil Pollution*, https://doi.org/10.1007/s11270-019-4176-z.
8. Rasmuson Anna, Kurt VanNess, Cesar A. Ron, **William P. Johnson**\*, **2019**, Hydrodynamic versus surface interaction impacts of roughness in closing the gap between favorable and unfavorable colloid transport conditions, *Environ. Sci. Technol.*, 53 (5) 2450-2459, 10.1021/acs.est.8b06162
9. **Johnson William**\*, Huilian Ma, Anna Rasmuson, Kurt VanNess, Ke Li, Cesar Ron, Brock Erickson, **2019**, Colloid Transport in Environmental Granular Porous Media: A Conceptual Description. in Maurice P.A. (Ed.) Encyclopedia of Water: Science, Technology & Society, John Wiley & Sons Inc., Hoboken, NJ. DOI: 10.1002/9781119300762.wsts0068 <https://onlinelibrary.wiley.com/doi/book/10.1002/9781119300762>.
10. **Johnson William**\*, Wayne Wurtsbaugh, Gary D. Belovsky, Bonnie K. Baxter, Frank Black, Cory Angeroth, Paul Jewell, Shu Yang, **2019**, Geochemistry of Great Salt Lake. in Maurice P.A. (Ed.) Encyclopedia of Water: Science, Technology & Society, John Wiley & Sons Inc., Hoboken, NJ. DOI:10.1002/9781119300762.wsts0072 <https://onlinelibrary.wiley.com/doi/book/10.1002/9781119300762>.
11. **Johnson\* W.P.**, A. Rasmuson, M. Hilpert, and E. Pazmino, **2018**, Why variant colloid transport behaviors emerge among identical individuals in porous media when colloid-surface repulsion exists. *Environ. Sci. Technol.*, 52 (13), pp 7230–7239, <https://doi.org/10.1021/acs.est.8b00811>.
12. Frederick L., A. Brunelle, M. Morrison, P. Crespo, **W.P. Johnson\***, **2017**, Holocene Reconstruction of the Paleoclimate of the Ecuadorian Andean Páramo and assessment of the mid-Holocene warm/dry event in Tres Lagunas, Ecuador, 28(7), 1131-1140, <https://doi.org/10.1177/0959683618761547>.
13. Hilpert M.A. and **W.P. Johnson**, **2017**, A binomial modeling approach for upscaling colloid transport under unfavorable attachment conditions: Emergent prediction of non-monotonic retention profiles, *Water Resources Research*, 54(1), <https://doi.org./10.1002/2017WR021454>.
14. Hilpert M., A. Rasmuson, **W.P. Johnson**, **2017**, A Binomial Modeling Approach for Upscaling Colloid Transport under Unfavorable Conditions: Organic Prediction of Extended Tailing, *Water Resources Research*, 53 (7), 5626-5644. 10.1002/2016WR020123.
15. Valdes C., F.J. Black, B. Stringham, J.N. Collins, J.R. Goodman, H.J. Saxton, C.R. Mansfield, J.N. Schmidt, and **W.P. Johnson\***, **2017**, Total Mercury and Methylmercury Response in Water Sediment, and Biota to Destratification of the Great Salt Lake, Utah, USA, *Environ. Sci. Technol.*, 51 (9), 4887-4896, <http://dx.doi.org/10.1021/acs.est.6b05790>.
16. Rasmuson A., E. Pazmino, Assemi S., **W.P. Johnson\***, **2017**, The Contribution of Nanoscale Roughness to Heterogeneity: Closing the Gap between Unfavorable and Favorable Colloid Attachment Conditions, *Environ. Sci. Technol.*, 51 (4), pp 2151–2160, DOI 10.1021/acs.est.6b05911.
17. Hunt Randall J. and **W.P. Johnson**, **2016**, Pathogen Transport in Groundwater Systems-Contrasts with Traditional Hydrogeological Approaches. *Hydrogeology Journal* 46(40), 551-560, DOI 10.1007/s10040-016-1502-z.
18. Frederick, L., J. VanDerslice, M. Taddie, K. Malecki, J. Gregg, N. Faust, **W.P Johnson\***, **2016**, Determination of Regional and National Mechanisms for Arsenic MCL Exceedance across the United States using CART, *Water Research*, 91, 295-304.
19. Tasci T. O., **Johnson W.P.**, Fernandez D.P., Manangon E., Gale\* B.K., **2015**, Particle Based Modeling of Electrical Field Flow Fractionation Systems, Chromatography, 2, 594-610; doi:10.3390/chromatography2040594.
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**BOOK CHAPTERS**

W.P. Johnson, **2008**, Mechanisms of Retention of Biological and Non-biological Colloids in Porous Media: Wedging and Retention in Flow Stagnation Zones in the Presence of an Energy Barrier to Deposition, in *Structure, Interactions and Reactivity at Microbial Surfaces*, T. Camesano and C. Mello eds., American Chemical Society Symposium Series 984, 339 pp.

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