

Xuelian Bai, Ph.D.

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Division of Hydrologic Sciences
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Education

- Ph.D.** 2013 Soil Science (Environmental Soil Chemistry), North Dakota State University
Dissertation: *Fate and transport of the estrogen conjugate 17 β -estradiol-17-sulfate in soil-water systems*
Advisor: Frank Casey
- M.S.** 2007 Soil Science (Soil Physics), China Agricultural University, Beijing, China
Thesis: *Sorption mechanisms of nanoparticles in saturated porous media: effects of ionic strength*
- B.S.** 2005 Agricultural Resources and Environment, China Agricultural University, Beijing, China
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Professional Experience

Assistant Research Professor, 2018 to present, Division of Hydrologic Sciences, Desert Research Institute
Maki Postdoctoral Fellow, 2015–2018, Division of Hydrologic Sciences, Desert Research Institute
Postdoctoral, 2014–2015, Soil/Range Science, North Dakota State University
Lecturer, Spring 2010, Soils and Pollution (Soils 480/680), Soil Science, North Dakota State University
Research Assistant, 2008–2013, Soil Science, North Dakota State University
Research Assistant, 2005–2007, Soil and Water Sciences, China Agricultural University, Beijing, China

Publications

Refereed Publications (*corresponding author)

1. **Bai***, X., K. Acharya. 2019. Using a freshwater green alga to remove seven endocrine disrupting chemicals (EDCs) from municipal wastewater effluents. *Environmental Pollution*. 247:534-540.
2. **Bai***, X., K. Acharya. 2019. Uptake of endocrine disrupting chemicals by quagga mussels (*Dreissena bugensis*) in aquatic ecosystems. *Environmental Science and Pollution Research*. 26:250-258.
3. Semreen*, M., A. Shanableh, L. Semerjian, H. Alniss, M. Mousa, **X. Bai**, K. Acharya. 2019. Simultaneous determination of pharmaceuticals by solid-phase extraction and liquid chromatography-tandem mass spectrometry: a case study from Sharjah sewage treatment plant. *Molecules*. 24, 633; doi:10.3390/molecules24030633.
4. **Bai***, X., A. Lutz, R. Carroll, K. Keteles, K. Dahlin, M. Murphy, D. Nguyen. 2018. Occurrence, distribution, and seasonality of emerging contaminants in urban watersheds. *Chemosphere*. 200:133-142.
5. **Bai***, X., K. Acharya. 2017. Algae-mediated removal of selected pharmaceutical and personal care products (PPCPs) from Lake Mead water. *Science of the Total Environment*. 581-582: 734-740.

6. **Bai***, **X.**, K. Acharya. 2016. Removal of trimethoprim, sulfamethoxazole, and triclosan by the green alga *Nannochloris sp.* *Journal of Hazardous Materials*. 315:70-75.
7. **Bai**, **X.**, F.X.M. Casey*, H. Hakk, T.M. DeSutter, P.G. Oduor, E. Khan. 2015. Sorption and degradation of 17 β -estradiol-17-sulfate in sterilized soil-water systems. *Chemosphere*. 119:1322-1328.
8. **Bai**, **X.**, F.X.M. Casey*, S.L. Shrestha, H. Hakk, Z. Fan. 2014. Modeling coupled sorption and transformation of 17 β -estradiol-17-sulfate in agricultural soils. *Journal of Contaminant Hydrology*. 168:17-24.
9. **Bai**, **X.**, F.X.M. Casey*, H. Hakk, T.M. DeSutter, P.G. Oduor, E. Khan. 2013. Dissipation and transformation of 17 β -estradiol-17-sulfate in soil-water systems. *Journal of Hazardous Materials*. 260:733–739.
10. Shrestha, S.L., **X. Bai**, D.J. Smith, H. Hakk*, F.X.M. Casey, G.L. Larsen, G. Padmanabhan. 2011. Synthesis and characterization of radiolabeled 17 β -estradiol conjugates. *Journal of Labelled Compounds and Radiopharmaceuticals*. 54:267–271.
11. DeSutter*, T., E. Vial, I. Rijal, M. Murdoff, A. Guy, X. Pang, S. Koltes, R. Luciano, **X. Bai**, K. Zitnick, S. Wang, F. Podrebarac, F. Casey, D. Hopkins. 2010. Integrating field-based research into the classroom: an environmental sampling exercise. *Journal of Natural Resources and Life Sciences Education*. 39:132–136.

Book Chapters

12. **Bai**, **X.** Fate and transport of estrogens and estrogen conjugates in manure-amended soils. *Animal Manure: Environmental Concerns, Mitigation, and Beneficial Utilization*. Editors: Heidi M. Waldrip, Paulo H. Pagliari, and Zhongqi He. Publisher: ASA-CSSA-SSSA Books. (in press)

Extension Publications

13. Oswal, H., **X. Bai**, D. Gerrity, K. Acharya, D. Devitt, C. Rock. 2018. Constituents of emerging concern in recycled water used for irrigation. Cooperative Extension, College of Agriculture & Life Sciences, University of Arizona.

Reports

14. **Bai**, **X.**, A. Lutz, R. Carroll. 2017. Occurrence of contaminants of emerging concern in the Denver-Metro Area: Review of USEPA Monitoring Data. DRI Institute Project Assignment.
15. **Bai**, **X.**, K. Acharya. 2015. State-of-the-art for direct potable reuse and its associated challenges-white paper. WaterStart, NV.
16. Acharya, K., **X. Bai**. 2015. A study of municipal wastewater effluent for potential uses in the Truckee Reno Industrial Complex Facilities in the Reno/Sparks area. WaterStart, NV.

Grants

Pending

1. **Bai**, **X.**, K. Acharya, H. Pham. Fate and transport of pharmaceutical and personal care products (PPCPs) in soils irrigated with reclaimed water—a comprehensive laboratory, lysimeter, and modeling study. USDA NIFA Agriculture and Food Research Initiative. **PI, \$439,112.**

2. Bandala, E., **X. Bai**, D. Vuono, K. Heintz, B. Hatchett, K. VanderMolen. Occurrence, fate, and transport of estrogenic activity in effluents released into the San Joaquin Delta: Assessment of climate change effects and their impact on human stressors. California Delta Science Program. **Co-PI, \$679,469.**

Awarded

3. **Bai, X.**, D. Moser. Evaluation of antibiotic resistance genes (ARGs) in the urban wetland ecosystem: Las Vegas Wash. USGS Nevada Water Resources Research Institute, 2018-2020. **PI, \$154,797.**
4. **Bai, X.** Developing an efficient method for extraction and quantification of trace organic chemicals in algal biomass. DRI Institute Project Assignment. 2018-2019. **PI, \$15,209.**
5. Sun, H., **X. Bai**. Advanced biotechnology for wastewater treatment: biofilms that degrade synthetic phenolic and aromatic pollutants. USGS Nevada Water Resources Research Institute, 2018-2020. **Co-PI, \$165,959.**
6. Gerrity, D., **X. Bai**, K. Acharya, D. Devitt, J. Edmonds, D. Moser. Plant uptake of contaminants of emerging concern in agroecosystems irrigated with reclaimed water. USDA NIFA Agriculture and Food Research Initiative Grant No. 2017-69007-26312, 2017-2020. **Co-PI, \$495,691.**
7. **Bai, X.**, K. Acharya. Uptake of pharmaceutical and steroidal compounds by quagga mussels in Lake Mead. USGS Nevada Water Resources Research Institute, 2016-2018. **PI, \$125,556.**
8. Acharya, K., **X. Bai**. Emerging contaminants affecting wastewater reuse in the Emirate of Sharjah, United Arab Emirates. University of Sharjah, Sharjah Research Academy and DRI, 2016-2018. **Co-PI, \$33,000.**
9. Acharya, K., **X. Bai**. Understanding bioaccumulation and ecotoxicological effects of pharmaceutical and personal care products in algae and quagga mussels in Lake Mead. DRI Maki PhD Fellowship, 2016-2019. **Co-PI.**

Declined

10. **Bai, X.** Sorption, mobility, and bioaccumulation of short-chain perfluoroalkyl acids. USEPA Science to Achieve Results (STAR) Program Early Career Grant. **Sole PI, \$499,589.**
11. **Bai, X.**, E. Bandala, K. Acharya, M. Rosen. Occurrence, fate, and transport of contaminants of emerging concern (CECs) in a semiarid urban watershed. NSF Environmental Engineering. **PI, \$329,878.**
12. **Bai, X.** Occurrence and ingestion of microplastics in freshwater ecosystems. DRI Innovation Research Program. **PI, \$30,236.**
13. **Bai, X.**, E. Bandala. Bacteria-induced photodegradation of pharmaceutical and personal care products (PPCPs) in Lake Mead. DRI Institute Project Assignment. **PI, \$13,744.**
14. **Bai, X.**, E. Bandala, K. Acharya, M. Rosen. Source, fate, and transport of contaminants of emerging concern (CECs) in a semiarid urban watershed. NSF Environmental Engineering. **PI, \$312,019.**
15. Moran, M., T. Tietjen, T. Thom, K. Acharya, **X. Bai**, J. Wilson, S. Gedo. What role does sediment-precipitated phosphate have in the occurrence and intensity of harmful algal blooms in Lake Mead, Lake Mead National Recreation Area? USGS-NPS Water Quality Partnership Project. **Co-PI, \$529,500.**

16. Acharya, K., **X. Bai**. Acute toxicity test for a TAED-based molluscicide on quagga mussels. **Co-PI**, \$31,131.
 17. **Bai, X.**, K. Acharya. Uptake of pharmaceuticals and personal care products by algae in aquatic systems. DRI Institute Project Assignment. **PI**, \$13,744.
 18. **Bai, X.**, K. Acharya, E. Dickenson. Developing exposure and toxicity data for priority trace organics (ciprofloxacin and azithromycin) in biosolid-amended soils. Water Environmental Research Foundation. **PI**, \$273,773.
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Fellowship and Scholarship

Maki Postdoctoral Fellowship, Desert Research Institute (2015–2018)
NSF/Soil Transformations in European Catchments Student Travel Fellowship, Reactive Transport Modeling Workshop, Crete, Greece (2012)
North Dakota Water Resources Research Institute Graduate Fellowship (2012)
North Dakota EPSCoR Doctoral Dissertation Assistantship (2011)
Frank Bain Graduate Student Scholarship, North Dakota State University (2011–2012)
Clarence and Cora Engberg Scholarship, North Dakota State University (2009–2011)

Synergistic Activities

Journal Review (40+ manuscripts)

Environmental Science & Technology, Water Research, Journal of Hazardous Materials, Chemosphere, Science of the Total Environment, Environmental Pollution, Journal of Agricultural and Food Chemistry, European Journal of Soil Science, Journal of Environmental Science, Environmental Science and Pollution Research, Vadose Zone Journal, Peer J, Applied Water Science

Proposal Review

National Science Centre of Poland (2018)
USGS Water Resources Research Institute National Competitive Grants (2016)

Thesis Co-advising

Harshad Oswal, Ph.D., Environmental Engineering, University of Nevada Las Vegas

Membership

American Chemistry Society

Conference Presentations

1. **Bai, X.**, K. Acharya. Uptake and removal of emerging contaminants by freshwater green algae. Nevada Water Resources Association Annual Conference. Jan 28-31, 2019, Reno, NV.
2. **Bai, X.**, K. Acharya. Using a freshwater green alga to remove emerging contaminants from water. Dec 9, 2018, College of Environment, Hohai University, Nanjing, China. (invited)
3. **Bai, X.**, K. Acharya. Using a freshwater green alga to remove endocrine disrupting chemicals (EDCs) from municipal wastewater effluents. American Chemistry Society Fall Meeting, Aug 19-23, 2018, Boston, MA.
4. Oswal, H., **X. Bai**, D. Gerrity, K. Acharya, D. Devitt, D. Moser, J. Edmonds. Role of ozone in agricultural water reuse applications. International Ozone Association PAG Conference, Aug 20-23, 2018, Las Vegas, NV.

5. **Bai, X.** Environmental fate and transport of contaminants of emerging concern. China Agricultural University Forum of Distinguished Young Scholars. Dec 27-28, 2017, Beijing, China. (invited)
6. **Bai, X., K. Acharya.** Uptake of hormones and pharmaceutical and personal care products by quagga mussels (*Dreissena bugensis*). American Chemistry Society Fall Meeting, Aug 20-24, 2017, Washington, D.C.
7. **Bai, X., K. Acharya.** Removal of selected pharmaceutical and personal care products by the green alga *Nannochloris sp.* American Geophysical Union Fall Meeting, Dec 12-16, 2016, San Francisco, CA.
8. **Bai, X., K. Acharya.** Removal of trimethoprim, sulfamethoxazole, and triclosan by the green alga *Nannochloris sp.* Universities Council on Water Resources Annual Conference, Jun 21-23, 2016, Pensacola Beach, FL.
9. **Bai, X., K. Acharya.** Removal of trimethoprim, sulfamethoxazole, and triclosan by the green alga *Nannochloris sp.* Lower Colorado River Science Symposium, Feb 8-9, 2016, Las Vegas, NV.
10. **Bai, X., F.X.M. Casey, H. Hakk.** Fate and transport of an estrogen conjugate in soil-water systems. American Water Resources Association Annual Conference, Nov 16-19, 2015, Denver, CO.
11. **Bai, X., F.X.M. Casey, H. Hakk.** Estrogen sulfate in soil-water systems: is it a potential source of free estrogens? Universities Council on Water Resources Annual Conference, Jun 16-18, 2015, Henderson, NV.
12. Shrestha, S.L., **X. Bai, K.B. Chambers, H. Hakk, F.X.M. Casey.** Role of conjugates in the fate and transport of steroid hormones. ASA-CSSA-SSSA International Annual Meetings, Oct 21-24, 2012, Cincinnati, OH.
13. **Bai, X., F.X.M. Casey, S.L. Shrestha, H. Hakk, T.M. DeSutter, P.G. Oduor, E. Khan.** Modeling sorption and transformation of 17 β -estradiol-17-sulfate in agricultural soils. American Geophysical Union Fall Meeting, Dec 5-9, 2011, San Francisco, CA.
14. **Bai, X., F.X.M. Casey, S.L. Shrestha, H. Hakk, T.M. DeSutter, P.G. Oduor, E. Khan.** Modeling sorption and transformation of 17 β -estradiol-17-sulfate in agricultural soils. ASA-CSSA-SSSA International Annual Meetings, Oct 16-19, 2011, San Antonio, TX.
15. **Bai, X., F.X.M. Casey, H. Hakk, T.M. DeSutter, P.G. Oduor, E. Khan.** Sorption and degradation of 17 β -estradiol-17-sulfate in agricultural soils. Manitoba Soil Science Society Annual Meeting, Feb 3-4, 2011, Winnipeg, Manitoba, Canada.
16. **Bai, X., F.X.M. Casey, H. Hakk, T.M. DeSutter, P.G. Oduor, E. Khan.** Sorption and degradation of 17 β -estradiol-17-sulfate in agricultural soils. ASA-CSSA-SSSA International Annual Meetings, Oct 31-Nov 3, 2010, Long Beach, CA.