Dr. Danhui Xin

Scientist
Southern California Coastal Water Research Project

Education

Ph.D., civil engineering, University of Delaware, 2021

M.Eng., environmental engineering, Tongji University, 2015

B.S., environmental engineering, Tongji University, 2012

Professional Experience

Scientist, Southern California Coastal Water Research Project. Costa Mesa, CA. 2023-present

Postdoctoral Researcher, University of Delaware, Department of Civil and Environmental Engineering. Newark, DE. 2021-2023

DENIN Environmental Fellow, University of Delaware, Delaware Environmental Institute. Newark, DE. 2018-2020

Research Assistant, Muroran Institute of Technology, Department of Architecture and Civil Engineering. Muroran, Japan. 2016

Visiting Scholar, University of Tokyo, Department of Environmental Systems. Tokyo, Japan. 2014

Summer Fellow, Kyushu University, Department of Urban and Environmental Engineering. Fukuoka, Japan. 2011

Honors and Awards

The Raymond Manganelli Award. 2022-2023

The Air Pollution Educational and Research Grant Scholarship Program. 2021-2022

C. Ellen Gonter Environmental Chemistry Paper Award, ACS Division of Environmental Chemistry. 2021

ACS ENVR-SETAC Exchange Travel Award. 2021

Graduate Student Award, ACS Division of Environmental Chemistry. 2020

Environmental Engineering Research Award, College of Engineering, University of Delaware. 2019

Carski Family Foundation Fellow. 2018-2020

Excellence in Student Service Award, Tongji University. 2011

University Student Leader Award, Tongji University. 2009

Selected Presentations and Conference Proceedings

Xin, D. 2025. One extraction, dual instrumental analysis of pesticide suites in water and passive samplers: Multi-laboratory method validation and SOP development. Oral Presentation, SETAC North America 46th Annual Meeting, Portland, OR.

Xin, D. 2025. Treatment effectiveness of microplastics in biofiltration: Runoff and media analysis. Oral Presentation, CASQA 2025, Pasadena, CA.

Xin, D. 2025. Monitoring microplastics in biofiltration: runoff and media sample collection and analysis. Oral Presentation, EWRI Congress, Anchorage, AK.

Xin, D. 2025. Media cation exchange capacity as a predictor of copper sorption in biofiltration. Oral Presentation, EWRI Congress, Anchorage, AK.

Xin, D. 2024. Media cation exchange capacity as a predictor of copper sorption in biofiltration. Oral Presentation, CASQA 2024, Sacramento, CA.

Xin, D. 2023. Application of voltametric microelectrodes for studying redox biogeochemistry in Prairie pothole wetland sediments. Oral Presentation, ACS National Meeting, Indianapolis, IN.

Xin, D. 2023. Application of voltametric microelectrodes for studying redox biochemistry in Arctic sedimentary porewaters. Poster Presentation, Toolik Field Station All Scientists Meeting, Santa Barbara, CA.

Xin, D. 2022. Field demonstration of an integrated nanoscale zero valent iron-hydrogen peroxide process for complete destruction of munitions constituents in wastewater. Poster Presentation, SERDP and ESTCP Symposium, Arlington, VA.

Xin, D. 2022. Abiotic reduction of munitions constituents by wood-derived biochar through its rechargeable electron storage capacity. Poster Presentation, Environmental Sciences: Water, Gordon Research Seminar and Conference, Holderness, NH.

Xin, D. 2021. Field demonstration of an integrated nZVI-H_2O_2 process for complete removal of munitions constituents in wastewater. Poster Presentation (co-author), SERDP and ESTCP Symposium 2021, Virtual.

Xin, D. 2021. Abiotic reduction of NTO, DNAN, and RDX by wood-derived biochar through its rechargeable electron storage capacity. Poster Presentation, SERDP and ESTCP Symposium 2021, Virtual.

Xin, D. 2021. Abiotic reduction and sorption of the insensitive munitions constituents by wood-derived biochars. Oral Presentation, SETAC North America 42nd Annual Meeting, Virtual.

Xin, D. 2021. Origin of electron storage capacity of black carbon (biochar): pyrolysis of lignocellulosic biomass. Invited Oral Presentation, Fall 2021 ACS National Meeting, Atlanta, GA.

Xin, D. 2021. Electron storage capacity (ESC) of biochar for supporting transformation of explosives. Oral Presentation, UD 2021 Graduate Students' Forum, Virtual.

Xin, D. 2021. Reductive transformation of 3-nitro-1,2,4-triazole-5-one (NTO) by biochar through its electron storage capacity (ESC) Oral Presentation, Spring 2021 ACS National Meeting, Virtual.

Xin, D. 2021. Comparison of mediated electrochemical analysis and chemical redox titration for measuring the electron storage capacity of biochar. Poster Presentation, Spring 2021 ACS National Meeting, Virtual.

Xin, D. 2020. Sorption and reductive degradation of munitions constituents by biochar", Poster Presentation, SERDP and ESTCP Symposium 2020, Virtual.

Xin, D. 2020. Quantifying and visualizing the spatial distribution of black carbon's electron storage capacity. Poster Presentation, Spring 2020 ACS National Meeting, Virtual.

Xin, D. 2019. Biochar as a nanosilver support medium for water disinfection. Oral Presentation, Fall 2019 ACS National Meeting, San Diego, CA.

Xin, D. 2019. Assessing the reversibility of electron storage capacity of biochar by chemical methods", Oral Presentation, Fall 2019 ACS National Meeting, San Diego, CA.

Xin, D. 2019. Chemical methods for determining the electron storage capacity of black carbon (biochar). Poster Presentation, Human and Climate Series III: Water Management and Policy, Dover, DE.

Xin, D. 2019. Quantifying and visualizing the electron storage capacity (ESC) of biochar. Oral Presentation, 4th DENIN Graduate Student Symposium, Newark, DE.

Xin, D. 2018. A method to prepare nano-silver-amended carbons for drinking water and irrigation water treatment. Exhibition and Poster Presentation, UD Tech Innovation Showcase, Newark, DE.

Xin, D. 2018. Electron storage capacities (ESC) of biochar and other black carbon materials. Oral Presentation, US Biochar Initiative (USBI) Biochar 2018, Wilmington, DE.

Xin, D. 2018. Biochar as a silver nanoparticle support for irrigation water treatment. Poster Presentation, CONSERVE Annual Meeting, College Park, MD.

Xin, D. 2018. Electron storage capacities of biochar and other black carbon materials. Poster Presentation, 3rd DENIN Graduate Student Symposium, Newark, DE.

Xin, D. 2017. Determining the electron storage capacities of carbonaceous geobatteries via chemical redox titration. Poster Presentation, 2nd DENIN Graduate Student Symposium, Newark, DE.

Xin, D. 2016. Modeling of soil gas profiles in the bared and vegetated areas of landfill. Oral Presentation, 9th Intercontinental Landfill Research Symposium, Noboribetsu, Hokkaido, Japan.

Xin, D. 2016. Survey on the status of the waste disposal sites in Hokkaido. Poster Presentation, Spring Conference of Japanese Society of Material Cycles and Waste Management, Tokyo, Japan.

Xin, D. 2014. The effect of vegetation on diel methane emission patterns in landfill. Poster Presentation, 8th Intercontinental Landfill Research Symposium, Crystal River, FL.

Xin, D. 2014. The effect of vegetation on diel methane emission patterns in landfill. Oral Presentation, 5th China-Japan Joint Conference for the Community Formation on Material Recycling and Solid Waste Management, Sapporo, Japan.

Xin, D. 2013. Dehydration and solidification/stabilization of high organic content sewage sludge by combined aluminate cement. Oral Presentation, 7th International Symposium on the East Asian Environmental Problems, Fukuoka, Japan.

Journal Articles

Xin, D., S. Sauers, D. Nguyen, J. Gray, E. Fassman-Beck. 2026. Field monitoring of microplastics in biofilter media: insights into media characteristics and design. *Blue-Green Systems* DOI:10.2166/bgs.2026.008.

Xin, D., S. Sauers, D. Nguyen, E. Fassman-Beck. 2026. Field Monitoring of Microplastics in Urban Runoff: Treatment Efficiency of Biofilters. *Environmental Science & Technology* DOI:10.1021/acs.est.5c18706.

McGruer, V., G. Braun, D. Xin, B.I. Escher, E. Fassman-Beck, A.C. Mehinto. 2026. Evaluating the Effectiveness of Street Sweeping for Reducing Toxicity of Urban Runoff. *ACS ES&T Water* 4:2301-2309.

Xin, D., A.P. Davis, E. Fassman-Beck. 2025. Assessment of PFOA and PFOS Sorption to Engineered Media in Biofiltration Columns. *Journal of Sustainable Water in the Built Environment* DOI:10.1061/JSWBAY.SWENG-668.

Choi, J., D. Xin, P.C. Chiu. 2025. A New Climate Impact of Wildfire Chars: Suppression of Biogenic Methane Production Over Repeated Redox Cycles. *Environmental Science & Technology* 59:16443-16451.

Xin, D., J. Gray, T. Zabala, A.P. Davis, E. Fassman-Beck. 2025. Impact of Media Properties on Dissolved Copper Sorption in Stormwater Biofiltration. *ACS ES&T Water* DOI:10.1021/acsestwater.5c00680.

Xin, D., J. Choi, D.K. Cha, B.P. Hubbard, S.M. Sheets, P.C. Chiu. 2025. Optimizing Fenton process for efficient destruction of energetic compounds in insensitive munitions explosives (IMX) wastewater. *Journal of Environmental Chemical Engineering* 13:116329.

Xin, D., J.M. Hudson, A. Sigman-Lowery, Y. Chin. 2024. Distribution and composition of redox-active species and dissolved organic carbon in Arctic lacustrine porewaters. *Arctic, Antarctic, and Alpine Research* 56:2371534.

Xin, D., W. Li, J. Choi, Y.H. Yu, and P.C. Chiu. 2023. Pyrogenic Black Carbon Suppresses Microbial Methane Production by Serving as a Terminal Electron Acceptor. Environmental Science & Technology 57(49): 20605-20614. DOI:10.1021/acs.est.3c05830

Chin, Y. P., D.M. McKnight, J. D'Andrilli, N. Brooks, K. Cawley, J. Guerard, E.M. Perdue, C.A. Stedmon, P.G. Tratnyek, P. Westerhoff, A. Wozniak, P.R. Bloom, C. Foreman, R. Gabor, J. Hamdi, B. Hanson, R.M. Hozalski, A. Kellerman, G. McKay, V. Silverman, R.G.M. Spencer, C. Ward, D. Xin, R.-O. Rosario, C.K. Remucal, and D. Reckhow. 2023. Identification of next-generation

International Humic Substances Society reference materials for advancing the understanding of the role of natural organic matter in the Anthropocene. Aquatic Sciences 85(32). doi:10.1007/s00027-022-00923-x

Xin, D., J. Giron, M.E. Fuller, and P.C. Chiu. Abiotic reduction of 3-nitro-1,2,4-triazol-5-one (NTO) and other munitions constituents by wood-derived biochar through its rechargeable electron storage capacity. 2022. Environmental Science: Processes & Impacts 24(2), 316-329. doi:10.1039/D1EM00447F

Xin, D., S. Nepu, M.T. Reza, J. Hudson, and P.C. Chiu. Pyrolysis creates electron storage capacity of black carbon (biochar) from lignocellulosic biomass. 2021. ACS Sustainable Chemistry & Engineering 9(19), 6821-6831. doi:10.1021/acssuschemeng.1c01251

Xin, D., T. Barkley, and P.C. Chiu. Visualizing electron storage capacity distribution in biochar through silver tagging. 2020. Chemosphere 248, 125952. doi:10.1016/j.chemosphere.2020.125952

Xin, D. and P.C. Chiu. 2020. Visualizing the distribution of black carbon's electron storage capacity using silver, MethodsX 7, 100838. doi:10.1016/j.mex.2020.100838

Nepu, S., D. Xin, P.C. Chiu, and M.T. Reza. 2019. Effect of pyrolysis temperature on acidic oxygen-containing functional groups and electron storage capacities of pyrolyzed hydrochars, ACS Sustainable Chemistry & Engineering 7(09): 8387-8396. doi:10.1021/acssuschemeng.9b00024

Xin, D., M. Xian, and P.C. Chiu. New methods for assessing electron storage capacity and redox reversibility of biochar. 2019. Chemosphere 215(01): 827-834. doi:10.1016/j.chemosphere.2018.10.080

Xin, D., M. Xian, and P.C. Chiu. 2018. Chemical methods for determining the electron storage capacity of black carbon, MethodsX 5: 1515-1520. doi:10.1016/j.mex.2018.11.007

Bian, R., D. Xin, and X. Chai. A simulation model for methane emissions from landfills with interaction of vegetation and cover soil. 2018. Waste Management 71(01): 267-276. doi:10.1016/j.wasman.2017.10.013

Bian, R., D. Xin, and X. Chai. A simulation model for estimating methane oxidation and emission from landfill cover soils. 2018. Waste Management 77(07): 426-434. doi:10.1016/j.wasman.2018.04.029

Bian, R., D. Xin, and X. Chai. 2018. Methane emissions from landfill: influence of vegetation and weather conditions, Environmental Technology (02): pp. 9. doi:10.1080/09593330.2018.1439109

Xin, D., Y. Hao, T. Shimaoka, H. Nakayama, and X. Chai. 2016. Site specific diel methane emission mechanisms in landfills: A field validated process based on vegetation and climate factors,

Environmental Pollution 218(11): 673-680. doi:10.1016/j.envpol.2016.07.060

Xin, D., X. Chai, and W. Zhao. 2016. Hybrid cement-assisted dewatering, solidification and stabilization of sewage sludge with high organic content, Journal of Material Cycles and Waste Management 18(02): 356-365. doi:10.1007/s10163-014-0337-8

Mahajan, D., D.J. Tonjes, S. Mamalis, R. Boudreaux, J.K. Hasty, D. Xin, Y. Zhao, J. Cao, W. Zhao, and X. Chai X. 2015. Effective landfill gas management strategies for methane control and reuse technology Journal of Renewable and Sustainable Energy 2015, 7(4): 041511. doi:10.1063/1.4929383

Technical Reports

Fassman-Beck, E., D. Xin, S. Sauers, D. Nguyen, J. Gray. 2026. Field Monitoring of Microplastics Loading and Accumulation in Biofiltration Best Management Practices. Technical Report 1457. Southern California Coastal Water Research Project. Costa Mesa, CA.

Fassman-Beck, E., E. Tiernan, D. Xin, A.C. Mehinto, V. McGruer, S. Sauers. 2025. Development of a Method to Measure the Impacts of Street Sweeping on Wet Weather Runoff Water Quality. Technical Report 1411. Southern California Coastal Water Research Project. Costa Mesa, CA.