Dr. Xiaolang Zhang
Assistant Professor of Hydrogeology
Department of Geosciences
Florida Atlantic University (FAU)
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RESEARCH INTERESTS

I study surface water-groundwater interactions in streams, saline lakes, and coastal areas using field observations, geophysical methods, and numerical models. Many of my studies seek to quantify how surface water-groundwater mixing influences water quality.

APPOINTMENTS

Aug. 2023~, Assistant Professor of Hydrogeology, FAU (*R1: Very High Research Spending and Doctorate Production & Top 100 U.S. Public University*)

Oct. 2021-Jul. 2023, Postdoc Researcher, the Ohio State University (OSU), Supervisor: Dr. Audrey Sawyer

EDUCATION

Ph.D., Sep. 2021, Hydrogeology, The University of Hong Kong (HKU)
Supervisors: Dr. Jiu Jimmy Jiao & Dr. Hailong Li
B.S., Jul.2016, Hydrogeology, China University of Geosciences in Beijing (CUGB)

TEACHING EXPERIENCE

(1) Fall 2023, Human Mission to Mars
(2) Fall 2023, Freshwater Issues in Coastal Areas
(3) Spring 2024, 2025, Hydrogeology
(4) Fall 2024, Groundwater Numerical Modeling
(5) Fall 2025, Subsurface Solute Transport Modeling

AWARDS

Scholar of the Year (2024), Schmidt College of Science Excellence Awards, Florida Atlantic University (College level)
Scholar of the Year (2024), Florida Atlantic University (University level)

MENTORING

2024~present, Rakib Howlader, PhD student, his research focuses on submarine groundwater discharge in coastal areas of Florida and US.

2024~present, Marjena Beantha Haque, PhD student, her research focuses on predicting groundwater levels in Florida using deep learning.

GRANTS

(1) Internal funding of Department of Geosciences, Florida Atlantic University. (PI, Oct. 2023-Oct. 2026, undergoing)
(2) School of Environmental, Coastal, and Ocean Sustainability (ECOS) Travel Grant, Florida Atlantic University (PI, $3,346, 2024, granted)
(3) ECOS publication grant (PI: $1,625, 2025, granted)
(4) College of Science Faculty Travel Award, Florida Atlantic University (PI, $1,000, 2025, granted)
(5) National Science Foundation, Collaborative Research: RAPID: Hurricane impacts on hydrogeology and nutrient geochemistry in karstic coastline (PI, $18,000, from Oct. 2024-Aug. 2025, granted)

PUBLICATIONS (※ graduate students advised, #Corresponding Author)

In Progress

(1) **Xiaolang Zhang**, Audrey H. Sawyer, Kamini Singha, and Ellen Wohl, Exploring the influence of morphologic heterogeneity and discharge on downstream transport in streams with multiple logjams: 2. Insight from numerical models (under revision in *Water Resources Research*).

PBULICATIONS as FIRST or CORRESPONDING AUTHORS:

1) Howlader, R.※, Liu, W., Ye, M., Wei, M., Haque, M.B.※ and **Zhang, X.#**, 2025. Systematic Quantification of Nearshore and Offshore Submarine Groundwater Discharge Along Florida Coasts. Journal of Geophysical Research: Oceans, 130(7): e2025JC022597.
2) Yu, S., **Zhang, X.#**, & Geng, X. 2025. Seasonal freezing enhances groundwater–lake connectivity and nutrient delivery in saline basins. Geophysical Research Letters, 52, e2025GL118495. **(Nature Index Journal)**
3) **Zhang, X.**, Li, H., Guo, W. and Liang, X., 2025b. Fractal signatures of hydraulic head variations reveal aquifer heterogeneity. Journal of Hydrology, 662: 134025.
4) **Zhang, X.**, Li, H., Wang, X., Kuang, X., Zhang, Y., Xiao, K. and Xu, C., 2024a. A comprehensive analysis of submarine groundwater discharge and nutrient fluxes in the Bohai Sea, China. Water Research, 253: 121320. **(Nature Index Journal)**

5) **Zhang, X**. and Jimmy, J.J., 2023. Numerical modelling study on non-steady-state groundwater flow systems in response to changing rainfall. Bulletin of Geological Science and Technology, 42(4): 154–161.
6) **Zhang, X.#**, Sawyer, A.H. and Singha, K., 2023b. A numerical exploration of hyporheic zone solute transport behavior estimated from electrical resistivity inversions. Journal of Hydrology, 621: 129577.
7) **Zhang, X**., Jiao, J.J. and Guo, W., 2022a. How Does Topography Control Topography-Driven Groundwater Flow? Geophysical Research Letters, 49(20): e2022GL101005. **(Nature Index Journal)**
8) **Zhang, X**., Jiao, J.J., Li, H., Zheng, Y., Yang, S. and Lian, E., 2022b. Salinization process in a topographically closed saline lake estimated by radium, barium, and chloride mass balances. Journal of Hydrology, 615: 128722.
9) **Zhang, X**., Li, H., Jiao, J.J., Luo, X., Kuang, X., Mao, R. and Hu, W., 2022c. Fractal Behaviors of Hydraulic Head and Surface Runoff of the Nested Groundwater Flow Systems in Response to Rainfall Fluctuations. Geophysical Research Letters, 49(2): e2021GL093784. **(Nature Index Journal)**
10) **Zhang, X**., Li, H., Jiao, J.J., Luo, X., Zuo, J., Lu, M., Liu, Y., Liang, W. and Kuang, X., 2021a. Control factors on nutrient cycling in the lake water and groundwater of the Badain Jaran Desert, China. Journal of Hydrology, 598: 126408.
11) **Zhang, X**., Luo, X., Jiao, J.J., Li, H., Lian, E., Yang, S., Kong, F., Kuang, X. and Zuo, J., 2021b. Hydrogeochemistry and fractionation of boron isotopes in the inter-dune aquifer system of Badain Jaran Desert, China. Journal of Hydrology, 595: 125984.
12) **Zhang, X**., Jiao, J.J., Li, H., Luo, X. and Kuang, X., 2020. Effects of Downward Intrusion of Saline Water on Nested Groundwater Flow Systems. Water Resources Research, 56(10): e2020WR028377.
13) Yu, S.‡ , **Zhang, X**.‡ , Li, H., Wang, X., Wang, C. and Kuang, X., 2022b. Analytical study for wave-induced submarine groundwater discharge in subtidal zone. Journal of Hydrology, 612: 128219. (‡ equal contribution)
14) Wang, Q.‡ , **Zhang, X**.‡ , Wang, X., Xiao, K., Zhang, Y., Wang, L., Kuang, X. and Li, H., 2021. Quantification of the water age and submarine groundwater discharge in a typical semi-enclosed bay using stable oxygen (18O) and radioactive radium (228Ra) isotopes. Journal of Hydrology, 603: 127088. (‡ equal contribution)

CO-AUTHORED PBULICATIONS:

1) Hasan, M.Y., **Zhang, X**., Xu, C., Tung, J.S., Rifat, A.A., Sonet, M.S., Kafy, A.-A., Rahman, S.S. and Faruque, M.J., 2025. Hydrogeochemical characterization and human health risk assessment for heavy metal contamination in coastal aquifers: A case study in Satkhira District, Bangladesh. Science of The Total Environment, 1003: 180640.
2) Kuang, X., Luo, X., Jiao, J.J., Liang, S., **Zhang, X**., Li, H. and Liu, J., 2019. Using stable isotopes of surface water and groundwater to quantify moisture sources across the Yellow River source region. Hydrological Processes, 33(13): 1835–1850.
3) Lu, M., Luo, X., Jiao, J.J., Li, H., Wang, X., Gao, J., **Zhang, X**. and Xiao, K., 2019. Nutrients and heavy metals mediate the distribution of microbial community in the marine sediments of the Bohai Sea, China. Environmental Pollution, 255: 113069.
4) Luo, M., Zhang, Y., Xiao, K., Wang, X., **Zhang, X**., Li, G. and Li, H., 2023. Effect of submarine groundwater discharge on nutrient distribution and eutrophication in Liaodong Bay, China. Water Research, 247: 120732.
5) Luo, X., Jiao, J.J., Liu, Y., **Zhang, X**., Liang, W. and Tang, D., 2018a. Evaluation of Water Residence Time, Submarine Groundwater Discharge, and Maximum New Production Supported by Groundwater Borne Nutrients in a Coastal Upwelling Shelf System. Journal of Geophysical Research: Oceans, 123(1): 631–655.
6) Luo, X., Kuang, X., Jiao, J.J., Liang, S., Mao, R., **Zhang, X**. and Li, H., 2018b. Evaluation of lacustrine groundwater discharge, hydrologic partitioning, and nutrient budgets in a proglacial lake in the Qinghai–Tibet Plateau: using 222Rn and stable isotopes. Hydrol. Earth Syst. Sci., 22(10): 5579–5598.
7) Marshall, A., **Zhang, X**., Sawyer, A.H., Wohl, E. and Singha, K., 2023. Logjam Characteristics as Drivers of Transient Storage in Headwater Streams. Water Resources Research, 59(3): e2022WR033139.
8) Wang, Q., Li, H., Zhang, Y., Wang, X., Xiao, K., **Zhang, X**., Huang, Y. and Dan, S.F., 2020a. Submarine groundwater discharge and its implication for nutrient budgets in the western Bohai Bay, China. Journal of Environmental Radioactivity, 212: 106132.
9) Wang, X., Fu, R., Li, H., Zhang, Y., Lu, M., Xiao, K., **Zhang, X**., Zheng, C. and Xiong, Y., 2020b. Heavy metal contamination in surface sediments: A comprehensive, large-scale evaluation for the Bohai Sea, China. Environmental Pollution, 260: 113986.
10) Wang, X., Li, H., Zheng, C., Yang, J., Zhang, Y., Zhang, M., Qi, Z., Xiao, K. and **Zhang, X**., 2018. Submarine groundwater discharge as an important

nutrient source influencing nutrient structure in coastal water of Daya Bay, China. Geochimica et Cosmochimica Acta, 225: 52–65.

11) Wang, X., **Zhang, X**., Wang, Z., Luo, M., Li, H., Zheng, C., Geng, X. and Liu, C., 2025. Review of seawater–groundwater interactions in the coastal earth critical zone of the Bohai Sea. Earth Critical Zone, 2: 100041.

12) Wang, Z., Wang, Q., Guo, Y., Yu, S., Xiao, K., Zhang, Y., Li, H., Zheng, C., Geng, X., **Zhang, X**., Li, H. and Wang, X., 2023. Seawater–Groundwater Interaction Governs Trace Metal Zonation in a Coastal Sandy Aquifer. Water Resources Research, 59(9): e2022WR032828.

13) Wu, P., Zeng, L., Zhu, X., Zhang, Y., Xiao, P., Zhao, X., Li, Q., Jiang, C., Chen, L. and **Zhang, X**., 2025. On the hydrological changes and their attribution analyses in the Dongting Lake Region in the past 60 years. Journal of Hydrology: Regional Studies, 59: 102428.

14) Xiao, K., Li, H., Shananan, M., **Zhang, X**., Wang, X., Zhang, Y., Zhang, X. and Liu, H., 2019. Coastal water quality assessment and groundwater transport in a subtropical mangrove swamp in Daya Bay, China. Science of The Total Environment, 646: 1419–1432.

15) Yang, C., Jia, Z., Xu, W., Wei, Z., **Zhang, X**., Zou, Y., McDonnell, J., Condon, L., Dai, Y. and Maxwell, R., 2025. CONCN: a high-resolution, integrated surface water–groundwater ParFlow modeling platform of continental China. Hydrol. Earth Syst. Sci., 29(9): 2201–2218.

16) Yu, S., Jiao, J.J., Luo, X., Li, H., Wang, X., **Zhang, X**., Yao, M., Zuo, J., Liang, W. and Lu, M., 2023. Evolutionary history of the groundwater system in the Pearl River Delta (China) during the Holocene. Geology, 51(5): 481–485.

17) Yu, S., Wang, C., Li, H., **Zhang, X**., Wang, X. and Qu, W., 2022a. Field and Numerical Investigations of Wave Effects on Groundwater Flow and Salt Transport in a Sandy Beach. Water Resources Research, 58(11): e2022WR032077.

18) Zhang, L., Zhu, E., Coronel-Zegarra, A., Somu, D.R., Dhar, S., Merk, V., **Zhang, X**. and Wang, R., 2025a. Development of a Ti_3C_2 MXene-AgNPs-based SERS platform for ionophore-based ion-selective detection. Sensors and Actuators B: Chemical, 433: 137524.

19) Zhang, Q., Wang, Y., **Zhang, X**., Mo, X., Zhang, P., Li, H., Jiao, J.J., He, C., Shi, Q., Fu, Q., Chen, B. and Wang, J., 2023a. Dissolved Organic Matter Characteristics and Composition of Saline Lakes in the Badain Jaran Desert, China. ACS Earth and Space Chemistry, 7(11): 2239–2251.

20) Zhang, Y.-P., Jiang, X.-W., **Zhang, X**., Zhang, Z.-Y., Wang, X.-S., Cao, G.-L., Wei, W. and Wan, L., 2024b. Pumping-induced groundwater aging and

rejuvenation in aquifer-aquitard systems: A perspective from regional groundwater flow. Journal of Hydrology, 632: 130718.

SELECTED ABSTRACTS

Zhang, X., Sawyer, S., Singha, K., Wohl, E., Exploring the influence of morphologic heterogeneity and discharge on downstream transport in streams with multiple logjams: Insight from numerical models. AGU Fall Meeting (oral), 12/2024/Washington DC

Zhang, X., Li, H., Wang, X., Kuang, X., Zhang, Y., Xiao, K., Xu, C., A Comprehensive Analysis of Submarine Groundwater Discharge and Nutrient Fluxes in the Bohai Sea, China, Water Research. AGU Fall Meeting, 12/2023/San Francisco

Zhang, X., Sawyer, S., Singha, K., Uncertainties in hyporheic zone solute transport estimated from electrical resistivity inversions: A numerical study. AGU Fall Meeting, 12/2022/Chicago

Zhang, X., Jiao, J., Li, H., Luo, X. and Kuang, X., Effects of saltwater infiltration on nested groundwater flow systems. AGU Fall Meeting, 12/2019/San Francisco

Zhang, X., Luo, X., Jiao, J., Li, H., Lian, E., Yang, S., and Zuo, J., Characterizing the groundwater flow pathways and recharge sources of a desert inter-dune aquifer system by geophysical approaches and multiple isotopes (B, H and O), EGU General Assembly2020.

Zhang, X., Fractal lake area in Badain Jaran Desert, China and its implication for the origin of water. AGU Fall Meeting, 12/2018/Washington DC

Zhang, X., Wang, C., Li, H., Jiao, J., Kuang, X., Luo, X., Li, S., Wang, X., Analytical solutions of wave pumping-driven seawater-groundwater circulation in horizontal permeable seabed, 5th Asia-Pacific Coastal Aquifer Management Meeting, 2017, Da Nang, Vietnam

INVITED PRESENTATIONS

2022, On the timescale and hydrological impacts for a lake evolving from fresh to saline state, School of Earth Sciences, Ohio State University

2021, Investigations on nested groundwater flow systems (NGFS), Byrd Polar and Climate Research Center, Ohio State University

Sep. 19, 2025, How Does Holocene Climate Change Impact the Availability of Freshwater in Arid Regions? WRRC seminar, Water Resources Research Center University of Hawai‘i at Mānoa

PROFESSIONAL SERVICE ACTIVITIES

1) **Associate Editor** of Journal of Hydrology (2025~now)

FLORIDA ATLANTIC UNIVERSITY

2) **Board members** of Regional Flow Commission of International Association of Hydrogeologists (IAH).
3) **Panelist of National Science Foundation (NSF) Hydrology Section.**
4) **Session Primary Convener and Chair,** AGU Fall Meeting 2023, San Francisco and online 11-15 Dec. 2023, H010-Advancement in coastal hydrogeology and implications for water quality and ecosystems.
5) Youth Editorial Board Member of *Carbon Footprints*
6) **Reviewer** for the book of Graphical Construction of Groundwater Flow Nets (https://books.gw-project.org/graphical-construction-of-groundwater-flow-nets/).
7) **Guest Editor** of Special Issue 'Permafrost Dynamics and Impacts on The Hydrology, Geomorphology, Ecosystem, and Infrastructure Based on Modeling, Observations, and Remote Sensing Products' on *Remote Sensing*, 2023-2024.
8) **Guest Editor** of Special Issue 'Fate and Transport of Anthropogenic Pollutants in Coastal and Marine Environments' on *Regional Studies in Marine Science*, 2023-2024.
9) **Guest editor** of Special Issue 'Impact of Groundwater Chemistry on Geological and Environmental Processes' on Geofluids, 2024-2025
10) **Reviewer** for multiple journals, including Nature Communications, Geophysical Research Letters, Water Resources Research, Advances in Water Resources, Water Research, Journal of Hydrology, Groundwater, Hydrogeology Journal, Marine Pollution Bulletin, Hydrological Processes, Applied Geochemistry, Frontiers in Water, Journal of Earth Sciences, Frontiers in Environmental Science, Alexandria Engineering Journal.
11) Reviewer for Outstanding Student Presentation Awards (OSPA) of AGU Fall Meeting 2023, 2024

UINVERSITY SERVICE ACTIVITIES

12) **Grant proposal reviewer,** for both the Environmental Science and Marine Science and Oceanography programs for the ECOS Palm Beach Boat Show grant, Florida Atlantic University.