

Zhi Li

Postdoctoral Research Associate at Pacific Northwest National Laboratory

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RESEARCH INTERESTS

Computational Hydrology & Hydraulics, Disturbance Hydrology, Environmental Fluid Mechanics, Sediment Transport, River Dynamics, Fluvial Geomorphology, Computational Fluid Dynamics, High Performance Computing

EDUCATION

- Ph.D. in Water Resources Engineering & Science, University of Illinois Urbana-Champaign** 2022
- *Thesis: Numerical Modeling Study on Meandering and Cutoff Dynamics* [\[link\]](#)
- M.S. in Environmental Engineering, Michigan State University** 2014
- B.S. in Geology, Nanjing University** 2012

RESEARCH EXPERIENCE

- Pacific Northwest National Laboratory** Mar. 2022 - Present
Postdoctoral Research Associate
- Ven Te Chow Hydrosystems Laboratory, University of Illinois Urbana-Champaign** 2016 - Feb. 2022
Graduate Research Assistant
- Environmental Fluid Mechanics Laboratory, University of Pittsburgh** 2014 - 2016
Graduate Research Assistant
- Groundwater Modeling Laboratory, Michigan State University** 2012 - 2014
Graduate Research Assistant
- MOE Key Laboratory of Surficial Geochemistry, Nanjing University** 2010 - 2012
Undergraduate Research Assistant

TEACHING AND MENTORING EXPERIENCE

- Undergraduate Student Research Mentor, University of Illinois** 2020 - 2021
- Through the Promoting Undergraduate Research in Engineering program and the Undergraduate Research Apprenticeship Program ([URAP](#)) (earned the Graduate College Mentoring Certificate)
- Teaching Assistant, University of Pittsburgh** 2015 - 2016
- CEE 2416 Sediment Transport (graduate-level)

PUBLICATIONS

PEER-REVIEWED/REVIEWING JOURNAL ARTICLES (* corresponding author)

- [WRR] Li, Zhi; Li, Bing; Jiang, Peishi; Hammond, Glenn E; Shuai, Pin; Zahura, Faria T; Coon, Ethan T; Chen, Xingyuan*. "Evaluating the effects of burn severity and precipitation on post-fire watershed responses using distributed hydrologic models." *Water Resources Research*, 2023. (under review) [\[preprint\]](#)
- [WRR] Li, Bing; Li, Zhi; Zheng, Jianqiu; Jiang, Peishi; Holmquist, James; Regier, Peter J; Hammond, Glenn E; Ward, Nicholas D; O'Meara, Theresa A; Pennington, Stephanie C; Megonigal, Patrick; Bailey, Vanessa L; Chen, Xingyuan*; Huang, Wei. "Integrated Effects of Site Hydrology and Vegetation on Exchange Fluxes and Carbon Cycling at the Coastal Terrestrial Aquatic Interface." *Water Resources Research*, 2023. (in revision) [\[preprint\]](#)

5. [JHYDROL] Adebayo, Moses; Bailey, Vanessa; Chen, Xingyuan; Hopple, Anya; Jiang, Peishi; Li, Bing; **Li, Zhi**; Martin-Hayden, James M; Megonigal, Patrick J; Regier, Peter J; Rich, Roy; Stegen, James C; Smith, Rick; Ward, Nicholas D; Woodard, Stella C; Doro, Kennedy O*. “A hydrogeophysical framework to assess infiltration during a simulated ecosystem-scale flooding experiment.” *Journal of Hydrology*, 2023. doi: [10.1016/j.jhydrol.2023.130243](https://doi.org/10.1016/j.jhydrol.2023.130243)
4. [FrontEarthSci] **Li, Zhi***; Mendoza, Alejandro; Abad, Jorge D; Endreny, Theodore A; Han, Bangshuai; Carrisoza, Eliseo; Dominguez, Ramon. “High-resolution modeling of meander neck cutoffs: laboratory and field scales.” *Frontiers in Earth Science*, 2023. doi: [10.3389/feart.2023.1208782](https://doi.org/10.3389/feart.2023.1208782)
3. [CAGEO] **Li, Zhi*** and Garcia, Marcelo H. “pyRiverBed: A Python framework to generate synthetic riverbed topography of constant-width meandering rivers.” *Computers & Geosciences*, 2021. doi: [10.1016/j.cageo.2021.104755](https://doi.org/10.1016/j.cageo.2021.104755)
2. [JGLR] Wang, Dongchen; **Li, Zhi***; Rojas-Aguirre, Andres F; and Garcia, Marcelo H. “Impact of Lake Michigan water level rise on complex bidirectional flow in the Chicago Area Water System (CAWS).” *Journal of Great Lakes Research*, 2021. doi: [10.1016/j.jglr.2021.10.008](https://doi.org/10.1016/j.jglr.2021.10.008)
1. [GEOMORPH] Rowley, Taylor*; Konsoer, Kory; Langendoen, Eddy J; **Li, Zhi**; Ursic, Michael; Garcia, Marcelo H. “Relationship of point bar morphology to channel curvature and planform evolution.” *Geomorphology*, 2020. doi: [10.1016/j.geomorph.2020.107541](https://doi.org/10.1016/j.geomorph.2020.107541)

CONFERENCE PRESENTATIONS

32. [AGU'23] **Li, Zhi**; Li, Bing; Jiang, Peishi; Hammond, Glenn E; Barnes, Morgan; Myers-Pigg, Allison N; Chen, Xingyuan. “Modeling the fates of pyrogenic carbon in the wildfire-impacted Pacific Northwest watersheds.” *AGU Fall Meeting*, 2023. [\[link\]](#)
31. [AGU'23] Chen, Xingyuan; **Li, Zhi**; Jiang, Peishi; Muller, Katherine A; Hammond, Glenn E; Song, Hyun-Seob. “Linking Organic Carbon Chemistry with Watershed Carbon Cycling.” *AGU Fall Meeting*, 2023. [\[link\]](#)
30. [AGU'23] Li, Bing; **Li, Zhi**; Zheng, Jianqiu; Regier, Peter J; Ding, Jun Yan; O'Meara, Teri; Pennington, Stephanie C; Ward, Nicholas D; Chen, Xingyuan. “Unraveling Coastal Biogeochemistry: Understanding the Impact of Saltwater Inundation through Integrated Modeling Approaches.” *AGU Fall Meeting*, 2023. [\[link\]](#)
29. [AGU'23] Stegen, James C; Datry, Thibault; Busch, Michelle H; Fisher, Joshua B; Zheng, Jianqiu; Herndon, Elizabeth M; Bam, Edward K; Painter, Scott L; Roche, Kevin Robert; Seybold, Erin; Sweetman, Jon; Kinsman-Costello, Lauren; Abrahamson, Jenna; Guimond, Julia; Regier, Peter J; Ladau, Joshua; Boye, Kristin E; Forbrich, Inke; Vander Vorste, Ross; Middleton, Beth; Burgin, Amy; Song, Hyun-Seob; Chen, Xingyuan; Fluet-Chouinard, Etienne; Bao, Jie; **Li, Zhi**; Deines, Jillian M; Li, Li; Rod, Kenton A; Scheibe, Timothy D; Wohl, Ellen. “Variable Inundation Across Earth's Terrestrial Ecosystems.” *AGU Fall Meeting*, 2023. [\[link\]](#)
28. [AGU'23] Kaufman, Matthew; Delgado, Dilman; Barnes, Morgan; Boehnke, Brandon; Chen, Xingyuan; Cornwell, Kali; Forbes, Brianna; Fulton, Stephanie; Garayburu-Caruso, Vanessa; Goldman, Amy; Gonzalez, Brianna; Grieger, Samantha; Hammond, Glenn; Jiang, Peishi; Laan, Maggi; Li, Bing; **Li, Zhi**; McKeever, Sophia; Mudunuru, Maruti; Muller, Katherine; Myers-Pigg, Allison N; Otensberg, Opal; Pelly, Aaron; Peta, Kelsey; Regier, Peter; Renteria, Lupita; Roebuck, Alan; Scheibe, Timothy; Son, Kyongho; Torgeson, Joshua; Hall, Robert; Zheng, Jianqiu; Stegen, James. “Respiration partitioning in the Yakima River Basin.” *AGU Fall Meeting*, 2023. [\[link\]](#)
27. [AGU'23] Coon, Ethan; Painter, Scott L; Moulton, John D; Bhanja, Soumendra N; Chen, Xingyuan; Gao, Bo; Jiang, Peishi; Li, Bing; **Li, Zhi**; Lipnikov, Konstantin; Molins, Sergi; Perez, Gabriel; Rathore, Saubhagya S; Shuai, Pin; Svyatskiy, Daniil; Xu, Zexuan. “How large-domain datasets have fundamentally altered the scale and complexity of spatially explicit hydrologic modeling.” *AGU Fall Meeting*, 2023. [\[link\]](#)
26. [IMAGE'23] Doro, Kennedy O; Adebayo, Moses B; Bailey, Vanessa L; Chen, Xingyuan; Hopple, Anya M; Jiang, Peishi; Li, Bing; **Li, Zhi**; Megonigal, Patrick; Ward, Nicholas D. “A hydrogeophysical imaging and modeling approach for predicting soil water saturation during a simulated coastal flooding experiment.” *The International Meeting for Applied Geoscience & Energy*, 2023. [\[link\]](#)
25. [RCEM'23] Luo, Yi; **Li, Zhi**; Langendoen, Eddy J; Garcia, Marcelo H. “Applications of geeCenterline, A New River Planform and Migration Detection Algorithm Based on Google Earth Engine.” *IAHR 13th River, Coastal And Estuarine Morphodynamics Symposium*, 2023. [\[link\]](#)
24. [RCEM'23] Abad, Jorge D; Marin-Diaz, Jesus; Rojas-Carbajal, Tania; **Li, Zhi**; Mendoza, Alejandro; Dominguez-Ruben, Lucas Gerardo. “Characterizing meandering and anabranching rivers in the Amazon basin.” *IAHR 13th River, Coastal And Estuarine Morphodynamics Symposium*, 2023. [\[link\]](#)

23. [**Goldschmidt'23**] Chen, Xingyuan; Li, Bing; **Li, Zhi**; Jiang, Peishi; Muller, Katherine A; Hammond, Glenn E; Zheng, Jianqiu; Song, Hyun-Seob. "Reactive Transport Modeling for Watershed Carbon and Nitrogen Cycling." *Goldschmidt*, 2023. [\[link\]](#)
22. [**Goldschmidt'23**] Kaufman, Matthew; Delgado, Dilman; Barnes, Morgan; Boehnke, Brandon; Chen, Xingyuan; Cornwell, Kali; Forbes, Brianne; Fulton, Stephanie; Garayburu-Caruso, Vanessa; Goldman, Amy; Gonzalez, Brianna; Grieger, Samantha; Hammond, Glenn; Jiang, Peishi; Laan, Maggi; Li, Bing; **Li, Zhi**; McKeever, Sophia; Mudunuru, Maruti; Muller, Katherine; Myers-Pigg, Allison N; Otenburg, Opal; Pelly, Aaron; Peta, Kelsey; Regier, Peter; Renteria, Lupita; Roebuck, Alan; Scheibe, Timothy; Son, Kyongho; Torgeson, Joshua; Hall, Robert; Zheng, Jianqiu; Stegen, James. "Respiration partitioning across the Yakima River Basin." *Goldschmidt*, 2023. [\[link\]](#)
21. [**SWS'23**] Li, Bing; **Li, Zhi**; Jiang, Peishi; Zheng, Jianqiu; Regier, Peter J; Hammond, Glenn E; Ward, Nicholas D; Pennington, Stephanie C; Chen, Xingyuan. "Investigating the Integrated Effects of Hydrology and Vegetation on Carbon Cycling at the Coastal Terrestrial-Aquatic Interface." *Society of Wetland Scientists Annual Meeting*, 2023. [\[link\]](#)
20. [**ICRW'23**] **Li, Zhi**; Li, Bing; Jiang, Peishi; Hammond, Glenn E; Shuai, Pin; Chen, Xingyuan. "Evaluating watershed hydrologic responses to wildfires in the Pacific Northwest using high-resolution numerical models." *8th Interagency Conference on Research in the Watersheds*, 2023. [\[link\]](#)
19. [**ESS-PI'23**] **Li, Zhi**; Li, Bing; Jiang, Peishi; Hammond, Glenn E; Shuai, Pin; Coon, Ethan; Muller, Katherine A; Myers-Pigg, Allison N; Barnes, Morgan E; Song, Hyun-Seob; Chen, Xingyuan; Moulton, David. "Watershed hydrologic and biogeochemical responses to wildfires in the Pacific Northwest." *Environmental System Science (ESS) PI Meeting*, 2023. [\[link\]](#)
18. [**ESS-PI'23**] Chen, Xingyuan; Myers-Pigg, Allison N; Barnes, Morgan E; Bladon, Kevin; Hammond, Glenn E; Jiang, Peishi; Kang, Hyunwoo; **Li, Zhi**; Scheibe, Timothy D; Wampler, Katie. "The Influence of Wildfires on Hydrobiogeochemical Processes: A MODEX Perspective." *Environmental System Science (ESS) PI Meeting*, 2023. [\[link\]](#)
17. [**ESS-PI'23**] Jiang, Peishi; **Li, Zhi**; Hammond, Glenn E; Muller, Katherine A; Song, Hyun-Seob; Garayburu-Caruso, Vanessa A; Kaufman, Matthew H; Fulton, Stephanie G; Stegen, James C; Chen, Xingyuan. "Integrated Modeling of Carbon and Nitrogen Cycling at the Yakima River Basin." *Environmental System Science (ESS) PI Meeting*, 2023. [\[link\]](#)
16. [**AGU'22**] **Li, Zhi**; Shuai, Pin; Chen, Xingyuan. "Evaluating the transport of wildfire-induced pyrogenic nutrients in a grassland-shrub dominant watershed using a high-res numerical model." *AGU Fall Meeting*, 2022. [\[link\]](#)
15. [**AGU'22**] Luo, Yi; **Li, Zhi**; Langendoen, Eddy J; Garcia, Marcelo H. "Obtaining synthetic riverbed topography of meandering rivers from satellite imagery: a case study of the Tallahatchie River, Mississippi." *AGU Fall Meeting*, 2022. [\[link\]](#)
14. [**AGU'21**] Luo, Yi; **Li, Zhi**; Langendoen, Eddy J; Garcia, Marcelo H. "An integrated river planform and sandbar detection tool based on Google Earth Engine and its application in the Yazoo-Mississippi Delta with high-resolution satellite images." *AGU Fall Meeting*, 2021. [\[link\]](#)
13. [**AGU'20**] **Li, Zhi**; Wang, Dongchen; Garcia, Marcelo H. "Modeling the hydrodynamics of Chicago Area Waterway System (CAWS) and nearshore areas in Lake Michigan: Investigation of different flow behaviors under low and high Lake Michigan level conditions." *AGU Fall Meeting*, 2020. [\[link\]](#)
12. [**AGU'20**] Guo, Xingyan; Xu, Mengzhen; Wang, Ruiyu; **Li, Zhi**; Chen, Dong; Garcia, Marcelo H; Best, Jim; Parker, Gary. "Triangle Shaped Bends Associated with Peat in the Zoige Basin, Northeast Qinghai-Tibet Plateau, China." *AGU Fall Meeting*, 2020. [\[link\]](#)
11. [**LargeRivers'20**] **Li, Zhi** and Garcia, Marcelo H. "Human impact on long-term meandering river migration." *IAHR International Conference on the Status and Future of the World's Large Rivers*, 2020 (postponed to 2021).
10. [**RiverFlow'20**] **Li, Zhi** and Garcia, Marcelo H. "2D numerical modeling on meander chute cutoffs." *IAHR River Flow Conference*, 2020. doi: [10.1201/b22619-74](https://doi.org/10.1201/b22619-74)
9. [**RiverFlow'20**] Guo, Xingyan; Parker, Gary; **Li, Zhi**; Garcia, Marcelo H; Chen, Dong; Tanaka, Gaku. "Sinuous rivers in peat." *IAHR River Flow Conference*, 2020. doi: [10.1201/b22619-219](https://doi.org/10.1201/b22619-219)
8. [**RCEM'19**] **Li, Zhi** and Garcia, Marcelo H. "Numerical modeling on meander chute cutoffs using hybrid deterministic-stochastic method." *IAHR 11th River, Coastal And Estuarine Morphodynamics Symposium*, 2019. [\[link\]](#)
7. [**AGU'18**] **Li, Zhi** and Garcia, Marcelo H. "An Improved Analytical Method to Generate Synthetic Bed Topography

- of Single-thread Constant-width Meandering Rivers.” *AGU Fall Meeting*, 2018. [\[link\]](#)
- [ISEH’18] Li, Zhi and Garcia, Marcelo H. “Two-dimensional and three-dimensional hydrodynamic modeling of the Calumet River System and Indiana Harbor and Ship Canal.” *IAHR 8th International Symposium on Environmental Hydraulics*, 2018.
 - [AGU’17] Li, Zhi and Garcia, Marcelo H. “Morphodynamic Responses of a River Floodplain System to a Chute Cutoff: Numerical Experiments to Investigate the Role of Multiple Active Factors.” *AGU Fall Meeting*, 2017. [\[link\]](#)
 - [RCEM’17] Mendoza, Alejandro; Abad, Jorge D; Li, Zhi; Arroyo, Maricela. “Migration of meandering rivers junction modeled numerically.” *IAHR 10th River, Coastal And Estuarine Morphodynamics Symposium*, 2017. [\[link\]](#)
 - [IllinoisWater’16] Li, Zhi and Garcia, Marcelo H. “Numerical investigation of pre-cutoff hydrodynamics.” *Illinois Water Conference*, 2016.
 - [AGU’16] Mendoza, Alejandro; Abad, Jorge D; Li, Zhi; Arroyo, Maricela. “Planform evolution modeling of confluences in meandering rivers.” *AGU Fall Meeting*, 2016. [\[link\]](#)
 - [RiverFlow’16] Li, Zhi; Mendoza, Alejandro; Abad, Jorge D; Endreny, Theodore A; Smallidge, Colin D; and Han, Bangshuai. “Cutoff processes and their importance for bed and planform morphodynamic adaptation.” *IAHR River Flow Conference*, 2016. doi: [10.1201/9781315644479](https://doi.org/10.1201/9781315644479)

SKILLS

- **Surface water, groundwater, sediment transport, reactive transport modeling:** TELEMAC, Delft3D, HEC-RAS, PFLOTRAN, Advanced Terrestrial Simulator (ATS)
- **CFD & meshing:** FLOW-3D, OpenFOAM, Fluent, ANSYS Meshing, Gmsh, BlueKenue
- **Programming languages (scientific computing oriented):** Python, C++, Fortran
- **Scientific visualization:** ParaView, Tecplot, VisIt, EnSight, Python-Matplotlib, R
- **GIS & CAD:** ArcGIS, AutoCAD, Civil 3D
- **HPC:** Rich experience in deploying & managing HPC projects on the world’s largest supercomputers and AWS EC2
- **Cloud computing:** AWS Certified Cloud Practitioner

GRANTS AND SCHOLARSHIPS

- (2020, Agency: TACC) Fellowship of the Texas Advanced Computing Center (TACC) 2020 Summer Institute on Computational Research Techniques - Scientific Visualization.
- (2020, Agency: CSDMS) Travel fund scholarship of the CSDMS Annual Meeting.
- (2019, Agency: NSF) Assisted PI on writing the allocation proposal requesting supercomputing resources on the NSF-supported XSEDE platform (Grant Number TG-CTS190067).

SERVICES

- Reviewer of scholarly journals: *Advances in Water Resources* | *Environmental Fluid Mechanics* | *Journal of Hydrologic Engineering* | *Journal of Hydraulic Engineering* | *Computers and Geosciences* | *Journal of Marine Science and Engineering* | *Geology* | *Stochastic Environmental Research and Risk Assessment*
- Convener of sessions GC43C and GC51R (Chair) in AGU Fall Meeting 2023
- AGU Earth and Planetary Surface Processes (EPSP) Section student committee member (2021-2022)
- Student volunteer of AGU Fall Meeting 2020
- Treasurer of IWRA student chapter at the University of Illinois (2019-2020)
- Exhibitor of UIUC Engineering Open House (2017-2020)

PROFESSIONAL AFFILIATIONS

- Member, American Geophysical Union (AGU) and Gilbert Geomorphology Club
- Member, International Water Resources Association (IWRA)

- Member, International Association for Hydro-Environment Engineering and Research (IAHR)
- Member, American Society of Civil Engineers (ASCE)
- Member, The United States Research Software Engineer Association (US-RSE)