

# ZHI LI

2017 Hydrosystems Laboratory, 301 North Mathews Ave, Urbana, Illinois 61801, USA

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## RESEARCH INTERESTS

Environmental Fluid Mechanics, Sediment Transport, Fluvial Morphodynamics, Computational Fluid Dynamics

## EDUCATION

**University of Illinois Urbana-Champaign, Dept. of Civil and Environ. Engr.** 2022  
*Ph.D. in Water Resources Engineering and Science* *Advisor: Prof. Marcelo H. García*

*Thesis: Numerical Modeling Study on Meandering and Cutoff Dynamics*

*Committee: Prof. Marcelo H. García (UIUC), Prof. Gary Parker (UIUC), Asst. Prof. Rafael O. Tinoco (UIUC), Prof. Bruce L. Rhoads (UIUC), Dr. Eddy J. Langendoen (National Sedimentation Laboratory, USDA-ARS)*

**Michigan State University, Dept. of Civil and Environmental Engineering** 2014  
*M.S. in Environmental Engineering*

**Nanjing University, School of Earth Sciences and Engineering** 2012  
*B.S. in Earth Sciences with Geology specialization*

## RESEARCH EXPERIENCE

**Ven Te Chow Hydrosystems Laboratory, University of Illinois Urbana-Champaign** 2016 - 2022  
*Graduate Research Assistant* *Supervisor: Prof. Marcelo H. García*

**Environmental Fluid Mechanics Laboratory, University of Pittsburgh** 2014 - 2016  
*Graduate Research & Teaching Assistant* *Supervisor: Asst. Prof. Jorge D. Abad*

**Groundwater Modeling Laboratory, Michigan State University** 2012 - 2014  
*Graduate Research Assistant* *Supervisor: Prof. Shu-Guang Li*

**MOE Key Laboratory of Surficial Geochemistry, Nanjing University** 2010 - 2012  
*Undergraduate Research Assistant* *Supervisors: Assoc. Prof. Lianwen Liu & Assoc. Prof. Liang Zhao*

## TEACHING AND MENTORING EXPERIENCE

**Undergraduate Student Research Mentor, University of Illinois** 2020 - 2021

- Supervised by the Promoting Undergraduate Research in Engineering ([PURE](#)) program of College of Engineering
- Research projects: 1) *CFD 101: Modeling the Chicago River*, and 2) *Fluvial Geomorphology 101: Modeling Meandering River Migration* (winner of the Best Presentation Award)

**Undergraduate Student Research Mentor, University of Illinois** 2020 - 2021

- Supervised by the Undergraduate Research Apprenticeship Program ([URAP](#)) of Office of Undergraduate Research
- Research projects: 1) *Simulating the Chicago River Flooding Issue*, and 2) *Reverse Engineering Hydraulic Modeling Visualization Tools by Implementing Delaunay Triangulation using Java*

**Teaching Assistant, University of Pittsburgh** 2015 - 2016

- CEE 2416 Sediment Transport (graduate-level)

## PUBLICATIONS

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### PEER-REVIEWED JOURNAL ARTICLES (\* corresponding author)

19. [AWR] **Zhi Li\*** and Marcelo H. García. “A hybrid deterministic-stochastic bank erosion model and its application to a meander cutoff event.” *Advances in Water Resources*, 2021. (under review)
18. [CAGEO] **Zhi Li\*** and Marcelo H. García. “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)
17. [JGLR] Dongchen Wang, **Zhi Li\***, Andrés F. Rojas-Aguirre and Marcelo H. García. “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)
16. [GEOMOR] Taylor Rowley\*, Kory Konsoer, Eddy J. Langendoen, **Zhi Li**, Michael Ursic and Marcelo H. García. “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)

### TECHNICAL REPORT

15. [MWRDGC] Chieh-Ying Chen, Dimitrios K. Fytanidis, Yifan He, **Zhi Li**, Marcelo H. García, Hao Luo, Andrés F. Rojas, Santiago Santacruz, Aaron Terrell, Dongchen Wang and Andrew R. Waratuke. “Invasive species mitigation alternatives impacts on the CAWS as it relates to flooding, water quality and navigation.” *Metropolitan Water Reclamation District of Greater Chicago (MWRDGC)*, 2020.

### CONFERENCE PRESENTATIONS

14. [AGU’21] Yi Luo, **Zhi Li**, Eddy J. Langendoen and Marcelo H. García. “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] **Zhi Li**, Dongchen Wang and Marcelo H. García. “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] Xingyan Guo, Mengzhen Xu, Ruiyu Wang, **Zhi Li**, Dong Chen, Marcelo H. García, Jim Best and Gary Parker. “Triangle Shaped Bends Associated with Peat in the Zoige Basin, Northeast Qinghai-Tibet Plateau, China.” *AGU Fall Meeting*, 2020. [\[link\]](#)
11. [LargeRivers’20] **Zhi Li** and Marcelo H. García. “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] **Zhi Li** and Marcelo H. García. “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] Xingyan Guo, Gary Parker, **Zhi Li**, Marcelo H. García, Dong Chen and G. Tanaka. “Sinuous rivers in peat.” *IAHR River Flow Conference*, 2020. doi: [10.1201/b22619-219](https://doi.org/10.1201/b22619-219)
8. [RCM’19] **Zhi Li** and Marcelo H. García. “Numerical modeling on meander chute cutoffs using hybrid deterministic-stochastic method.” *IAHR 11th River, Coastal And Estuarine Morphodynamics Symposium*, 2019. [\[link\]](#)
7. [AGU’18] **Zhi Li** and Marcelo H. García. “An Improved Analytical Method to Generate Synthetic Bed Topography of Single-thread Constant-width Meandering Rivers.” *AGU Fall Meeting*, 2018. [\[link\]](#)
6. [ISEH’18] **Zhi Li** and Marcelo H. García. “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.

5. [AGU'17] **Zhi Li** and Marcelo H. García. "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. [\[link\]](#)
4. [RCER'17] Mendoza Alejandro, Jorge D. Abad, **Zhi Li** and Maricela Arroyo. "Migration of meandering rivers junction modeled numerically." *IAHR 10th River, Coastal And Estuarine Morphodynamics Symposium*, 2017. [\[link\]](#)
3. [IllinoisWater'16] **Zhi Li** and Marcelo H. García. "Numerical investigation of pre-cutoff hydrodynamics." *Illinois Water Conference*, 2016.
2. [AGU'16] Mendoza Alejandro, Jorge D. Abad, **Zhi Li** and Maricela Arroyo. "Planform evolution modeling of confluences in meandering rivers." *AGU Fall Meeting*, 2016. [\[link\]](#)
1. [RiverFlow'16] **Zhi Li**, Mendoza Alejandro, Jorge D. Abad, Theodore A. Endreny, Colin D. Smallidge and Bangshuai Han. "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)

## TALKS

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5. "A hybrid deterministic-stochastic bank erosion model and its application to a meander cutoff event", *UIUC Geo-Hydro Discussion Group*, Urbana, Illinois, USA, 2021.
4. "pyRiverBed: A Python framework to generate synthetic riverbed topography of constant-width meandering rivers", *CSDMS Summer Science Series*, Boulder, Colorado, USA (event moved online), 2020. [\[link\]](#)
3. "Two-dimensional and three-dimensional hydrodynamic modeling of the Calumet River System and Indiana Harbor and Ship Canal", *8th International Symposium on Environmental Hydraulics*, South Bend, Indiana, USA, 2018.
2. "A numerical model for river meanders: Open-Telemac (Part II)", *UIUC Geo-Hydro Discussion Group*, Urbana, Illinois, USA, 2018.
1. "Cutoff processes and their importance for bed and planform morphodynamic adaptation", *River Flow conference*, St. Louis, Missouri, USA, 2016.

## SKILLS

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- **Geophysical flow and sediment transport modeling:** Proficient in TELEMAC, Delft3D, HEC-RAS
- **CFD & meshing:** Proficient in FLOW-3D, OpenFOAM, Fluent, ANSYS Meshing, Gmsh, BlueKenue
- **Programming languages (scientific computing oriented):** Proficient in Python, Matlab, C, Fortran
- **Scientific visualization:** Proficient in Tecplot, ParaView, VisIt, EnSight, Python-Matplotlib, R
- **GIS & CAD:** Proficient in ArcGIS, AutoCAD, Civil 3D
- **HPC:** Rich experience in deploying HPC projects on AWS EC2, campus clusters and supercomputers
- **Cloud computing:** AWS Certified Cloud Practitioner (Validation Number DS3KMN71NBF41S34)

## GRANTS AND SCHOLARSHIPS

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- (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 advisor on writing the allocation proposal requesting supercomputing resources on the NSF-supported XSEDE platform (Grant Number TG-CTS190067).

## **OTHER SERVICES**

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- Reviewer of scholarly journals: Advances in Water Resources, Journal of Hydrologic Engineering, Journal of Hydraulic Engineering, Geology, Computers and Geosciences, Journal of Marine Science and Engineering
- AGU Earth and Planetary Surface Processes (EPSP) Section student committee member (2021-2022)
- Volunteer of AGU Fall Meeting (2020)
- Exhibitor of UIUC Engineering Open House (2017-2020)
- Treasurer of IWRA student chapter at the University of Illinois (2019-2020)

## **PROFESSIONAL AFFILIATIONS**

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- 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)