

ZHI LI

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RESEARCH INTERESTS

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

EDUCATION

University of Illinois at Urbana-Champaign, Dept. of Civil and Environ. Engr. 2016 - 2021 (expected)

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

Michigan State University, Dept. of Civil and Environmental Engineering

2012 - 2014

M.S. in Environmental Engineering

Nanjing University, School of Earth Sciences and Engineering

2008 - 2012

B.S. in Earth Sciences with Geology specialization

RESEARCH EXPERIENCES

Ven Te Chow Hydrosystems Laboratory, University of Illinois at Urbana-Champaign 2016 - Present

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 EXPERIENCES

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

PEER-REVIEWED JOURNAL ARTICLES (* denotes corresponding author)

20. [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: <https://doi.org/10.1016/j.cageo.2021.104755>
19. [AWR] **Zhi Li*** and Marcelo H. García. “A hybrid deterministic-stochastic riverbank erosion model and its application to a meander cutoff event.” *Advances in Water Resources*, 2021. (under review)
18. [GLR] 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. (in revision)
17. [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: <https://doi.org/10.1016/j.geomorph.2020.107541>

JOURNAL ARTICLES IN PREPARATION

16. [GLR] **Zhi Li***, Dongchen Wang, Andrés F. Rojas-Aguirre and Marcelo H. García. “Numerical study to evaluate the flooding risk in the north Chicago Area Waterway System (CAWS).” *Journal of Great Lakes Research*, 2021. (in prep)
15. [ESPL] **Zhi Li**, Alejandro Mendoza, Jorge D. Abad*, Theodore A. Endreny and Bangshuai Han. “Modeling river and floodplain interactions through meander cutoffs.” *Earth Surface Processes and Landforms*, 2021. (in prep)

TECHNICAL REPORT

14. [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

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.” *American Geophysical Union Fall Meeting*, 2020.
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.” *American Geophysical Union Fall Meeting*, 2020.
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.
10. [RiverFlow’20] **Zhi Li** and Marcelo H. García. “2D numerical modeling on meander chute cutoffs.” *IAHR River Flow Conference*, 2020.
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.
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.
7. [AGU’18] **Zhi Li** and Marcelo H. García. “An Improved Analytical Method to Generate Synthetic Bed Topog-

raphy of Single-thread Constant-width Meandering Rivers.” *American Geophysical Union Fall Meeting*, 2018.

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.” *American Geophysical Union Fall Meeting*, 2017.
4. [RCEM’17] Mendoza Alejandro, Jorge D. Abad, **Zhi Li** and M. Arroyo. “Migration of meandering rivers junction modeled numerically.” *IAHR 10th River, Coastal And Estuarine Morphodynamics Symposium*, 2017.
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 M. Arroyo. “Planform evolution modeling of confluences in meandering rivers.” *American Geophysical Union Fall Meeting*, 2016.
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.

TALKS

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. [[website](#)]
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

- **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

- (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

- Reviewer of scholarly journals: Advances in Water Resources, Journal of Hydrologic Engineering, Journal of Hydraulic Engineering, Geology
- AGU Earth and Planetary Surface Processes (EPSP) Section student committee member
- Volunteer of AGU Fall Meeting
- Treasurer of IWRA student chapter at the University of Illinois.

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)