

Longhuan Zhu, Ph.D.

Postdoctoral Researcher, Great Lakes Research Center, Michigan Technological University

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EDUCATION

Ph.D. in Civil Engineering (Ocean/Coastal Engineering Focus)	University of Maine, 2020
M.Eng. in Naval Architecture and Ocean Engineering	Tianjin University, 2015
B.Eng. in Naval Architecture and Ocean Engineering	Tianjin University, 2012
B.Mgt. in Project Management (double major)	Tianjin University, 2012

ACADEMIC EMPLOYMENT

Postdoctoral Researcher, Michigan Technological University	2021-present
Graduate Teaching Assistant, University of Maine	2019-2020
Graduate Research Assistant, University of Maine	2015-2019

RESEARCH INTERESTS

1. Natural and nature-based solutions for coastal protection, restoration, and resilience to adapt to and mitigate the impacts of climate change
2. Numerical modeling of wave-current-sediment processes including extreme wave events, sediment transport, coastal erosion, and flooding
3. Fluid-structure-interaction modeling including wave-current-vegetation interaction and wave attenuation by vegetation and aquaculture structures
4. Dynamical modeling of offshore engineering structures including jacket platforms, floating structures, and integrated multi-trophic aquaculture (IMTA) system
5. Digital twin technologies in coastal, offshore, and aquaculture engineering

PEER-REVIEWED PUBLICATIONS

Total: 14, including 2 in *Coastal Engineering* (IF=5.427), 1 in *JGR Ocean* (IF=3.94), 1 in *Ocean Engineering* (IF=4.372), 1 in *Advances in Water Resources* (IF=5.361), 1 in *Reviews in Aquaculture* (IF=10.618), 1 in *Frontiers in Marine Science* (IF=5.247), etc.

Citations: 148 (Google Scholar on Jan 20, 2023)

H-Index: 7 (Google Scholar on Jan 20, 2023)

1. **Zhu, L.**, Huguenard, K., Fredriksson, D. W., & Lei, J. (2022). Wave attenuation by flexible vegetation (and suspended kelp) with blade motion: Analytical solutions. *Advances in Water Resources*. DOI: 10.1016/j.advwatres.2022.104148
2. Huang, C., **Zhu, L.**, Ma, G., Meadows, G. A., & Xue, P. (2021). Wave Climate Associated with Changing Water Level and Ice Cover in Lake Michigan. *Frontiers in Marine Science*. DOI:10.3389/fmars.2021.746916.
3. **Zhu, L.**, Lei, J., Huguenard, K., & Fredriksson, D. W. (2021). Wave attenuation by suspended canopies with cultivated kelp (*Saccharina latissima*). *Coastal Engineering*. DOI: 10.1016/j.coastaleng.2021.103947

4. **Zhu, L.**, Huguenard, K., Zou, Q., Fredriksson, D. W., & Xie, D. (2020). Aquaculture farms as nature-based coastal protection: Random wave attenuation by suspended and submerged canopies. *Coastal Engineering*. DOI: 10.1016/j.coastaleng.2020.103737
5. **Zhu, L.**, Zou, Q., Huguenard, K., & Fredriksson, D. W. (2020). Mechanisms for the Asymmetric Motion of Submerged Aquatic Vegetation in Waves: A Consistent-Mass Cable Model. *Journal of Geophysical Research: Oceans*, 125(2). DOI: 10.1029/2019jc015517
6. Bricknell, I.R., Birkel, S.D., Brawley, S.H., Van Kirk, T., Hamlin, H., Capistrant-Fossa, K., Huguenard, K., Van Walsum, G., Liu, Z.L., **Zhu, L.H.**, Grebe, G., Taccardi, E., Miller, M., Preziosi, B.M., Duffy, K., Byron, C.J., Quigley, C.T.C., Bowden T.J., Brady, D., Beal, B.F., Sappati, P.K., Johnson, T.R., & Moeykens, S. (2020). Resilience of cold water aquaculture: A review of likely scenarios as climate changes in the Gulf of Maine. *Reviews in Aquaculture*. DOI: 10.1111/raq.12483
7. Birthisel, S.K., Eastman, B.A., Soucy, A.R., Paul, M., Clements, R.S., White, A., Acquafredda, M.P., Errickson, W., **Zhu, L.H.**, Allen, M.C., & Mills, S.A. (2020). Convergence, continuity, and community: a framework for enabling emerging leaders to build climate solutions in agriculture, forestry, and aquaculture. *Climatic Change*, pp.1-15. DOI: 10.1007/s10584-020-02844-w
8. **Zhu, L.**, Huguenard, K., & Fredriksson, D. W. (2019). Dynamic Analysis of Longline Aquaculture Systems with a Coupled 3D Numerical Model. *Proceedings of the 29th International Ocean and Polar Engineering Conference (ISOPE 2019)*, 1305–1310. <https://onepetro.org/conference-paper/ISOPE-I-19-235>
9. **Zhu, L.**, Huguenard, K., & Fredriksson, D. (2018). Interaction between Waves and Hanging Highly Flexible Kelp Blades. *Coastal Engineering Proceedings*, 1(36), papers.31. DOI: 10.9753/icce.v36.papers.31
10. **Zhu, L.**, & Zou, Q. (2017). Three-Layer Analytical Solution for Wave Attenuation By Suspended And Non-suspended Vegetation Canopy. *Coastal Engineering Proceedings*, 1(35), waves.27. DOI: 10.9753/icce.v35.waves.27
11. Tang, Y. G., Li, Y., Wang, B., Liu, S. X., & **Zhu, L. H.** (2016). Dynamic analysis of turret-moored FPSO system in freak wave. *China Ocean Engineering*, 30(4), 521-534. DOI: 10.1007/s13344-016-0032-8
12. Tang, Y., **Zhu, L.**, Li Y., Liu C., & Zhang, S. (2016). Pushover analysis on a jacket offshore platform in the South China Sea. *China Ocean Engineering (Chinese version)*, (02), 105-110. DOI: 10.16483/j.issn.1005-9865.2016.02.014
13. Tang, Y., Qing, Z., **Zhu, L.**, & Zhang, R. (2015). Study on the structural monitoring and early warning conditions of aging jacket platforms. *Ocean Engineering*, 101, 152-160. DOI: 10.1016/j.oceaneng.2015.04.011
14. Tang, Y., **Zhu, L.**, & Li, Y. (2015). Nonlinear vibration analysis of combination parametric resonance for TTRs in deep water. *Journal of Tianjin University Science and Technology (Chinese version)*, 48(9), 811-816. DOI: 10.11784/tdxbz201402022

SEMINARS AND INVITED PRESENTATIONS

1. Coastal protection and resilience: natural and nature-based solutions with aquaculture structures. *Dauphin Island Sea Lab, University of South Alabama, AL, April 15, 2022.*
2. Modeling the dynamics of kelp aquaculture farms. *MIT Sea Grant, MIT, Cambridge, MA, July 24, 2019*

3. Green alternatives to wave attenuation in changing climate. *Graduate Student Climate Adaptation Partners (GradCAP) webinar*, USDA Northeast Climate Hub, online, November 15, 2018

CONFERENCE PRESENTATIONS

1. **Zhu, L.**, Xue, P., Kayastha, M.B., & Meadows, G. A. (2022). Nearshore Sediment Transport Influenced by a Coastal Structure in Storm Events (poster). *In AGU Fall Meeting 2022*. Chicago, IL, 12-16 December 2022
2. **Zhu, L.**, Xue, P., Huang, C., & Meadows, G. A. (2022). Accelerated Coastal Erosion in Southern Lake Michigan under Wave Climate Change. *In 12th International Workshop on Modeling the Ocean (IWMO2022)*. Ann Arbor, Michigan, June 28 to July 1, 2022
3. **Zhu, L.**, Xue, P., Huang, C., & Meadows, G. A. (2022). Coastal Erosion along Lake Michigan under Climate Change. *In Joint Aquatic Sciences Meeting 2022 (JASM2022)*. Grand Rapids, Michigan, May 14-20, 2022.
4. **Zhu, L.**, Xue, P., Huang, C., Ma, G., & Meadows, G. A. (2022). Wave Climate and Water Level Changes in Lake Michigan. *In Ocean Sciences Meeting 2022 (OSM2022)*. Online, Feb 27, 2022 – Mar 4, 2022.
5. **Zhu, L.**, Xue, P., Huang, C., & Meadows, G. A. (2021). Sediment Transport in Lake Michigan under a Changing Wave Climate. *In 26th Biennial CERF Conference (CERF2021)*. Online, 1–4 and 8–11 November 2021.
6. **Zhu, L.**, Huguenard, K., & Fredriksson, D. W. (2021). Modeling wave attenuation by flexible vegetation with blade dynamics. *5th International Symposium of Shallow Flows*, Nanjing, China, 23-25 October 2021.
7. **Zhu, L.**, Huguenard, K., & Fredriksson, D. W. (2019). Dynamic Analysis of Longline Aquaculture Systems with a Coupled 3D Numerical Model. *The 29th International Ocean and Polar Engineering Conference (ISOPE2019)*, Honolulu, Hawaii, USA, June 16-21, 2019.
8. **Zhu L.**, Huguenard K., Fredriksson, D.W. (2019). A 3D Numerical Model to Simulate the Dynamics of Longline Kelp Farms In Waves. *Northeast Aquaculture Conference & Exposition and the 39th Milford Aquaculture Seminar*, Boston, MA, January 9-11, 2019.
9. **Zhu, L.**, Huguenard, K., & Fredriksson, D. (2018). Interaction between Waves and Hanging Highly Flexible Kelp Blades. *The 36th International Conference on Coastal Engineering (ICCE2018)*, Baltimore, Maryland, July 30 – August 3, 2018.
10. Fredriksson, D.W., Beaver, B., St. Gelais, A., Drach, A., **Zhu, L.**, Dewhurst., T., & Costa-Pierce, B. (2018). Hydrodynamic Characteristics of Macroalgae Grown On a Long-Line Aquaculture System from Physical Model Tests. *Aquaculture America 2018*, Las Vegas, NV, February 19-22, 2018.
11. **Zhu, L. H.**, Huguenard, K. D., & Fredriksson, D. W. (2017). Wave attenuation through suspended highly flexible vegetation (kelp farm). *In 24th Biennial CERF Conference (CERF2017)*, Providence, RI, November 5-9, 2017.
12. **Zhu, L.**, & Zou, Q. (2016). Three-Layer Analytical Solution for Wave Attenuation By Suspended And Non-suspended Vegetation Canopy. *The 35th International Conference on Coastal Engineering (ICCE2016)*, Antalya, Turkey, November 17-20, 2016.

PROFESSIONAL SERVICES

Members: *American Society of Civil Engineers (ASCE)*, *American Geophysical Union (AGU)*, *Coastal & Estuarine Research Federation (CERF)*

Proposal reviewer: *Maryland Sea Grant*

Journal guest editor (special issues): *Journal of Marine Science and Engineering*

Journal reviewer: *Water Resources Research, Ocean Engineering, Applied Ocean Research, Journal of Hydraulic Research, Environmental Fluid Mechanics, Scientific Report, Frontiers in Marine Science, Frontiers in Built Environment, Water, Journal of Marine Science and Engineering, Sustainability, Buildings, Eng.*

HONORS AND AWARDS

Graduate Student Climate Adaptation Partners (GradCAP), USDA Northeast Climate Hub,	2018
Member of the Honor Society of Phi Kappa Phi, the Chapter at the University of Maine	2017
Sustainable Ecological Aquaculture Network (SEANET) Fellowship, University of Maine	2015
Graduate Research Fellowship, Tianjin University	2012
Outstanding Graduate of Tianjin University, Tianjin University	2012
Tianjin Municipal Government Scholarship, Tianjin Municipal Government	2011
Outstanding Student in Science and Technology, Tianjin University	2010
First place at the National High School Mathematics League, Chinese Mathematical Society	2007