

Jilian Xiong

Curriculum Vitae

Woods Hole Oceanographic Institution
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Education

Ph.D.	Physical Oceanography, Virginia Institute of Marine Science, William & Mary, Virginia, USA	2022
M.S.	Marine Geology, Nanjing University, Nanjing, China	2018
B.S.	Marine Science, Nanjing University, Nanjing, China	2015

Research Interests

Estuarine and coastal circulation; Multi-scale numerical ocean modeling; Biophysical interactions; Tracer transport and dispersion; Water quality modeling; Hypoxia; Harmful algal blooms; Environmental DNA; Sediment transport

Academic Appointments

Incoming Assistant Professor, Department of Marine Science, University of Texas at Austin (2027-)
Postdoctoral Investigator, Woods Hole Oceanographic Institution (Jun. 2025 - present).
Postdoctoral Scholar, School of Oceanography, University of Washington (Sep. 2022 - May. 2025).

Publications

First-Authored

- [13] Xiong, J., Geyer, R., MacCready, P. Annual deepwater renewal in a double-sill fjord estuary (in preparation).
- [12] Xiong, J., Chen, K., Zhang, W., Britten, G. L. A mesoscale-eddy-resolving circulation model for the Northwest Atlantic and Gulf Stream: NWA5k-ROMS v1.0 (submitted).
- [11] Xiong, J., MacCready, P., Lesson, A. Impact of estuarine exchange flow on multi-tracer budgets in the Salish Sea (2025). *Journal of Geophysical Research: Oceans*, 130(11), e2024JC021645.
- [10] Xiong, J., MacCready, P., Brasseale, E. A., Allan, E. A., Ramon-Laca, A., Parsons, K., Shaffer, M., Kelly, P. (2025). Advective transport drives environmental DNA dispersal in an estuary. *Environmental Science & Technology*, 59(15), 7506-7516.
- [9] Xiong, J., MacCready, P. (2024). Intercomparisons of Tracker v1. 1 and four other ocean particle-tracking software packages in the Regional Ocean Modeling System. *Geoscientific Model Development*, 17(8), 3341-3356.
- [8] Xiong, J., Shen, J., Qin, Q., Tomlinson, M. C., Zhang, Y. J., Cai, X., Ye, F., Cui, L., Mulholland, M. R. (2023). Biophysical interactions control the progression of harmful algal blooms in Chesapeake Bay: a novel Lagrangian particle tracking model with mixotrophic growth and vertical migration. *Limnology and Oceanography Letters*, 8(3), 498-508.
- [7] Xiong, J., Shen, J., Wang, Q. (2022). Storm-induced coastward expansion of *Margalefidinium polykrikides* in Chesapeake Bay. *Marine Pollution Bulletin*, 184, 114187.
- [6] Xiong, J., Shen, J. (2022). Vertical transport timescale of surface-produced particulate material in the Chesapeake Bay. *Journal of Geophysical Research: Oceans*, 127(2), e2021JC017592.
- [5] Xiong, J., Shen, J., Qin, Q. (2021). Exchange flow and material transport along the salinity gradient in a long estuary. *Journal of Geophysical Research: Oceans*, 126(5), e2021JC017185.
- [4] Xiong, J., Shen, J., Qin, Q., Du, J. (2021). Water exchange and its relationship with external forcings and residence time in Chesapeake Bay. *Journal of Marine Systems*, 215, 103497.
- [3] Xiong, J., You, Z., Li, J., Gao, S., Wang, Q., Wang, Y. P. (2020). Variations of wave parameter statistics as influenced by water depth in coastal and shelf areas. *Coastal Engineering*, 159, 103717.

- [2] Xiong, J., Wang, Y. P., Gao, S., Du, J., Yang, Y. (2018). On estimation of coastal wave parameters and wave-induced shear stress. *Limnology and Oceanography: Methods*, 16(9): 594-606.
- [1] Xiong, J., Wang, X. H., Wang, Y. P., Chen, J., Shi, B., Gao, J., Yang, Y., Yu, Q., Li, M., Yang, L., Gong, X. (2018). Mechanisms of maintaining high suspended sediment concentration over tide-dominated offshore shoals in the Southern Yellow Sea. *Estuarine, Coastal and Shelf Science*, 191, 221-233.

Co-Authored

- [13] Savoie, A., Hinson, K., Bird, A., Ringham, M., Scott, E., Cross, J., Subban, C., Labossiere, A., Pages, R., Xiong, J., Yang, Z., & Ward, N. (2026). Integrating laboratory-based secondary precipitation thresholds with ocean biogeochemistry models to advance ocean alkalinity enhancement decision-making. <https://doi.org/10.21203/rs.3.rs-10639502/v1>
- [12] Ward, N. D., Hinson, K., Pages, R., Cross, J., Friedrichs, M. A. M., Hauri, C., MacCready, P., Subban, C. **Xiong, J.**, St-Laurent, P., Yang, Z. Regional Ocean biogeochemical modeling challenges for predicting the effectiveness of marine carbon dioxide removal. *Frontiers in Climate*, 7: 1640617.
- [11] Becca, B., Allen, S., **Xiong, J.**, Maldonado, M. Impact of water mass dynamical and property variability on the inflow of a semi-enclosed sea (2025). *Biogeosciences*, 22(22), 7309-7336.
- [10] Leeson, A., Mascarenas, D., **Xiong, J.**, MacCready, P., Horner-Devin, A. R., Brett, M. T. Weak, low-oxygen exchange flow drives hypoxia in Puget Sound's Inlets (in review).
- [9] Brasseale, E., Adams, N., Allan, E. A., Liu, O., MacCready, P., Moore, S., Parsons, K., Shaffer, M., **Xiong, J.**, Kelly R. Marine eDNA production and loss mechanisms. *Journal of Geophysical Research: Oceans*. 130(4), e2024JC021643.
- [8] Graham, O. J., Al-Haj, A., Arrington, E. C., Arsenault, E. R., Barbosa, C. C., Bice, K., ... **Xiong, J.** & Xue, T. (2023). Better Together: Early Career Aquatic Scientists Forge New Connections at Eco-DAS XV. *Limnology and Oceanography Bulletin*, 119-121.
- [7] Qin, Q., Shen, J., Tuckey, T. D., Cai, X., **Xiong, J.** (2022). Using Forward and Backward Particle Tracking Approaches to Analyze Impacts of a Water Intake on Ichthyoplankton Mortality in the Appomattox River. *Journal of Marine Science and Engineering*, 10(9), 1299.
- [6] Wang, Q., Lu, Y., Hu, C., Hu, Y., Zhang, M., Jiao, J., **Xiong, J.**, Liu, Y., Zhang, Z. (2021). Discrimination of biomass-burning smoke from clouds over the ocean using MODIS measurements. *IEEE Transactions on Geoscience and Remote Sensing*.
- [5] Wang, Q., Zhang, Z., Hao, Z., Liu, B., **Xiong, J.** (2021). Optical classification of coastal water body in China using hyperspectral imagery CHRIS/PROBA. In IOP Conference Series: Earth and Environmental Science (Vol. 668, No. 1, p. 012017). IOP Publishing.
- [4] Yang, Y., Gao, S., Wang, Y. P., Jia, J., **Xiong, J.**, Zhou, L. (2020). Revisiting the problem of sediment motion threshold. *Continental Shelf Research*, 187, 103960.
- [3] Cheng, G., Wang, Y. P., Voulgaris, G., Du, J., Sheng, J., **Xiong, J.**, Xing, F. (2020). Sediment exchange between channel and sand ridges in the southern Yellow Sea: The importance of tidal asymmetries. *Continental Shelf Research*, 205, 104169.
- [2] Du, J., Shen, J., Park, K., Yu, X., Qin, Q., **Xiong, J.**, Chen, Y. (2020). Using observed bacteria concentration and modeled transit time under an analytical framework to estimate overall removal rate of fecal coliform in an estuary. arXiv preprint arXiv:2001.07603.
- [1] Tang, J., Wang, Y. P., Zhu, Q., Jia, J., **Xiong, J.**, Cheng, P., Wu, H., Chen, D., Wu, H. (2019). Winter storms induced high suspended sediment concentration along the seabed offshore of north Yangtze Estuary. *Estuarine, Coastal and Shelf Science*, 228, 106351.

Mentorship & Teaching

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- Danling Ma (Graduate student, WHOI-MIT joint program, 2025)
Advised on learning a regional ocean model I developed in the Northwest Atlantic Ocean.
 - Aurora Leeson (Graduate student, Civil & Environmental Engineering, UW, 2024-2025)
Advised on oxygen budget analysis and model design for ocean alkalinity enhancement.

- Dakota Mascarenas (Graduate student, Civil & Environmental Engineering, UW, 2025)
Advised on building high-resolution nested model in Penn Cove, Puget Sound.
- Jesse Vance (Oceanographer, Ebb Carbon, 2024-2025)
Guided LiveOcean model implementation and experiment design of ocean alkalinity enhancement.
- Lab instructor (2018)
Sediment grain-size measurement for students in the Environmental Earth Science double-master's program (joint program of Freie Universität Berlin and Nanjing University).

Presentations

Invited Talks

- [6] Xiong, J., Coastal-estuarine exchange across scales: circulation, mixing, and tracer transport. University of Delaware, Mar. 2026.
- [5] Xiong, J., Coastal-estuarine exchange across scales: circulation, mixing, and tracer transport. University of Texas at Austin, Mar. 2026.
- [4] Xiong, J., From currents to consequences: How Physical Circulation and Beyond Shape Estuarine Ecosystem. University of South Carolina, Oct. 2025.
- [3] Xiong, J., MacCready, P. Introduction of LiveOcean models. UW MG&G seminar, Oct. 2024.
- [2] Xiong, J., Shen, J., Qin, Q., Tomlinson, M. C., Zhang, Y. J., Cai, X., Ye, F., Cui, L., Mulholland, M. R. Biophysical interactions control the progression of harmful algal blooms in the lower Chesapeake Bay. Gordon Research Seminar, Jun. 2023.
- [1] Ecological Dissertations in the Aquatic Sciences 2023 March in Honolulu, Hawaii (invited participant).

Oral Presentations

- [19] **Xiong, J.**, Geyer, R., MacCready, P. Annual deepwater renewal in a double-sill fjord estuary. PECS. Aug. 2026
- [18] **Xiong, J.**, Geyer, R., MacCready, P. Annual deepwater renewal in a double-sill fjord estuary. WHOI Postdoc Symposium. Feb. 2026
- [17] Hinson, K., Yang, Z., Ward, N., Savioe, A., St-Laurent, P., Labossiere, A. K., Friedrichs, M. M., Pages, R., Hauri, C., **Xiong, J.**, MacCready, P., Subban, C. V., Cross, J. Improving connections between ocean alkalinity enhancement and carbon cycling in coastal domains. CERF, Nov. 2025.
- [16] Lesson, A., Mascarenas, D., **Xiong, J.**, MacCready, P., Horner-Devine, A., Brett, M. Weak, low-oxygen exchange flow drives hypoxia in Puget Sound's inlets. Puget Sound Institute workshop, Feb. 2025.
- [15] **Xiong, J.**, MacCready, P., Brasseale, E. A., Allan, E. A., Ramon-Laca, A., Parsons, K., Shaffer, M., Kelly, P. Ocean transport dominates the dispersal of environmental DNA in a nearshore marine environment. AGU, Dec. 2024.
- [14] MacCready, P., **Xiong, J.**, Lesson, A. Impact of estuarine exchange flow on multi-tracer budgets in the Salish Sea. Physics of Estuaries and Coastal Seas (PECS), Sep. 2024.
- [13] Brasseale, E., Adams, N. G., Allan, E., Jacobson, E. K., Kelly, R. P., Liu, O. R., Moor, S., Schaffer, M., **Xiong, J.**, Parsons, K. Marine eDNA production and loss mechanisms. Eastern Pacific Ocean Conference (EPOC), Sep. 2024.
- [12] **Xiong, J.**, MacCready, P., Lesson, A. Impact of estuarine exchange flow on multi-tracer budgets in the Salish Sea. WHOI COFDAL Seminar, Aug. 2024.
- [11] Brasseale, E., Adams, N. G., Allan, E., Jacobson, E. K., Kelly, R. P., Liu, O. R., Moor, S., Schaffer, M., **Xiong, J.**, Parsons, K. Effect of time-variation in environmental DNA (eDNA) shedding on distribution of detectable eDNA in a hydrodynamic model. Ocean Science Meeting, Feb. 2024.
- [10] **Xiong, J.**, Shen, J., Qin, Q., Tomlinson, M. C., Zhang, Y. J., Cai, X., Ye, F., Cui, L., Mulholland, M. R. Biophysical interactions control the progression of harmful algal blooms in the lower Chesapeake Bay. UW Physical Oceanography seminar, Nov. 2022.

- [9] **Xiong, J.**, Shen, J., Qin, Q., Tomlinson, M. C., Zhang, Y. J., Cai, X., Ye, F., Cui, L., Mulholland, M. R. Biophysical interactions control the progression of harmful algal blooms: a novel Lagrangian particle tracking model with mixotrophic growth and vertical migration. Chesapeake Community Research Symposium, Jun. 2022.
- [8] **Xiong, J.**, Shen, J., Qin, Q. Vertical transport timescale of surface produced particulate material in the Chesapeake Bay. Ocean Science Meeting, Mar. 2022.
- [7] **Xiong, J.**, Shen, J., Qin, Q., Tomlinson, M. C., Zhang, Y. J., Cai, X., Ye, F., Cui, L., Mulholland, M. R. Developing an individual-based model for *Margalefidinium Polykrikoides* blooms in the lower Chesapeake Bay via coupled hydrodynamic model, algal behaviors, and satellite data. Physical Department Seminar of VIMS, Feb. 2022.
- [6] **Xiong, J.**, Shen, J., Qin, Q., Du., J. Long-term water exchange and material transport in Chesapeake Bay. CERF, Nov. 2021.
- [5] **Xiong, J.**, Shen, J., Qin, Q., Bathymetry controls on water reflux and material transport in Chesapeake Bay. Physical Department Seminar of VIMS, Mar. 2021.
- [4] **Xiong, J.**, Shen, J. Transport pathway and timescale of dissolved and particulate materials from diverse sources in Chesapeake Bay. Chesapeake Community Research Symposium, Jun. 2020.
- [3] **Xiong, J.**, Shen, J. A study of water exchange and material transport in Chesapeake Bay. Physical Department Seminar of VIMS, Mar. 2020.
- [2] **Xiong, J.**, Shen, J. Qin, Q., Du, J. Effects of discharge and wind on exchange flow and residence time in Chesapeake Bay. CERF, Nov. 2019.
- [1] **Xiong, J.**, Wang, X. H., Wang Y. P, Chen, J., Shi, B., Gao, J., Yang, Y., Yu, Q., Li, M., Yang, L., Gong, X. Mechanisms of high SSC and its influence on turbulence dissipation in the Southern Yellow Sea. 14th Annual Meeting Asia Oceania Geosciences Society, Aug. 2017.

Poster Presentations

- [9] **Xiong, J.**, Scully, M., Geyer, WR. Physical controls on the formation of a subsurface oxygen minimum in a fjord estuary, Physical Oceanography Early Career Researcher Symposium at URI. Sep. 2026
- [8] **Xiong, J.**, Chen, K., Zhang, G., Britten, G. An eddy-resolving circulation model for the Northwest Atlantic Ocean and Gulf Stream. WHOI Postdoc Poster Party, Apr. 2026
- [7] Hinson, K., Ward, N., St-Laurent, P., Pagès, R., **Xiong, J.**, Friedrichs, M.A.M., Hauri, C., MacCready, P. Yang, Z. Experimentally Supported Representations of Modeled Ocean Alkalinity Enhancement. AGU, Dec. 2024.
- [6] Yin, D., Ganju, N., Harris, C., Radiceinasab, A., Ralston, D., Warner, J., **Xiong, J.** A numerical modeling framework for the simulation of estuary saltwater intrusion and coastal flooding over the Albemarle-Pamlico Sound Estuarine System. AGU, Dec. 2024.
- [5] Mullholland, M. R., Echevarria, M. A., Vega, E. P., Bernhardt, P. W., Zhu, Y., Macias-Tapia, A., Tomlinson, M. C., Curtis, K., Hofmann, E. E., Clayton, S., **Xiong, J.**, Qin, Q., Shen, J. Summertime heat waves in the lower Chesapeake Bay and their effects on blooms of the harmful algae *Margalefidinium polykrikoides*. Ocean Science Meeting, Feb. 2024.
- [4] **Xiong, J.**, MacCready, P., Brasseale, E. A., Allan, E. A., Ramon-Laca, A., Parsons, K., Shaffer, M., Kelly, P. Transport dynamics of environmental DNA from a known point source of marine mammals. CERF, Nov. 2023.
- [3] **Xiong, J.**, MacCready, P. Intercomparisons of five ocean particle tracking software packages. Gordon Research Conference – Coastal Ocean Dynamics, Jun. 2023.
- [2] **Xiong, J.**, Shen, J. Origins and transport pathway of deep channel material in Chesapeake Bay. Ocean Science Meeting, Feb. 2020.
- [1] **Xiong, J.**, Wang, Y.P. Estimation of combined wave and current shear stress over the offshore shoal in the Southern Yellow Sea. 2nd Workshop on Sediment Dynamics of Muddy Coasts and Estuaries, Oct. 2015.

Skills

- Proficient in numerical simulation using both unstructured (SCHISM) and structured (ROMS, EFDC) grid ocean models.
- Experienced in programming with Python, MATLAB, and Fortran.
- Skilled in high-performance computing (HPC) and Linux environments.

Academic & Professional Service

Journal Review

Continental Shelf Research; EGU sphere; Estuaries and Coast; Estuarine, Coastal and Shelf Science; Environmental Science & Technology; Frontiers in Marine Science; Journal of Geophysical Research: Oceans; Journal of Marine Systems; Limnology and Oceanography Letters; Marine Ecology Progress Series; Marine Geology; Marine Pollution Bulletin; Nature Communications; Ocean and Coastal Research; Ocean Modelling; Ocean Science; Progress in Oceanography; Scientific Report

Proposal Review

Woods Hole Oceanographic Institution Sea Grant
Maryland Sea Grant

Conferences & Seminars

CERF2021 and 2023 student poster and oral presentation judge
Moderator for three sessions at Ocean Science Meeting, 2024
WHOI Physical Oceanography Department seminar coordinator, 2025-2026

Awards & Honors

- Best Ph.D. Student Paper Award at VIMS (2023)
- Dean's Fellowship at VIMS (2020-2021)
- VIMS Commonwealth Coastal Research Fellowship (2020-2021)
- Norfolk Southern Fellowship at VIMS (2019-2020)
- William J. Hargis, Jr. Fellowship at VIMS (2019-2020)
- Zeigler Fellowship at VIMS (2018-2020)
- CERF 2021 Participation Award (2021)
- Student Travel Grant, VIMS (2019, 2021, 2022)
- Outstanding Graduate Thesis Award of Jiangsu Province, China (2019)
- First-class Yingcai Scholarship, Nanjing University (2017)
- National Inspiration Scholarship, Nanjing University (2012, 2013, 2014)
- People's Scholarship, 1st Class, Nanjing University (2014)
- Second-class Guanghua Educational Scholarship, Nanjing University (2012)