JILIAN XIONG

Postdoc
School of Oceanography, University of Washington, Seattle 98195, WA
Email: jxiong7@uw.edu; xiongjilian@gmail.com

EDUCATION

Ph.D. in Physical Oceanography, August 2022, Virginia Institute of Marine Science, William & Mary, Williamsburg, VA, USA
Master of Science in Marine Geology, June 2018, Nanjing University, Nanjing, China
Bachelor of Science in Marine Science, June 2015, Nanjing University, Nanjing, China

RESEARCH INTERESTS

Estuarine and coastal dynamics
Numerical ocean modeling
Physical-biological interactions
Lagrangian particle tracking
Harmful algal blooms
Hypoxia
Environmental DNA
Pollutant transport and diffusion
Water quality modeling
Sediment transport

RESEARCH EXPERIENCE

Postdoc Scholar (Sep. 2022-present). Advisor: Dr. Parker MacCready
School of Oceanography, University of Washington, WA.

- Developed a high-resolution ocean model and conducted Lagrangian particle tracking experiments to study the fate and transport of Environmental DNA in Hood Canal. The model has been applied for pre-sampling design to improve the detection probability of eDNA shed from rare targets.
- Constructed tracer budgets, including heat, total nitrogen, and dissolved oxygen in the Salish Sea and its inner basins and assessing the contributions from exchange flow.

Research Assistant (2018-2022). Advisor: Dr. Jian Shen
Virginia Institute of Marine Science, William & Mary, Williamsburg, VA.

- Added biological modules to SCHISM's particle tracking code to simulate harmful algal blooms and investigated the expansion of HAB to coastal area after a tropical storm.
- Modified EFDC model to calculate transport timescales for riverine non-conservative materials and surface-produced particulates.
- Built two high-resolution ocean models to support solving strong rip currents induced safety issues for National Park Service and the channel dredging program of US Coast Guard.

Research Assistant (2015-2018). Advisor: Dr. Ya Ping Wang
Nanjing University, Nanjing, China.

- Proposed an empirical equation to estimate significant wave height from shallow to deep waters based on high-frequent pressure and velocity data.
- Synthesized the applicability of various algorithms to estimate wave orbital velocity from different instrumental measurements at various depths.
- Developed MATLAB codes to remove the influence of turbulence when calculating wave orbital velocity from near-bottom high-frequency velocity measurements.
- Proposed mechanisms for maintaining high background suspended sediment concentrations in the

southern Yellow Sea, China

PUBLICATIONS

FIRST-AUTHORED

Xiong, J., MacCready, P., Brasseale, E. A., Allan, E. A., Ramon-Laca, A., Parsons, K., Shaffer, M., Kelly, P. Ocean transport drives environmental DNA dispersal in a nearshore marine environment (submitted to ES&T).

Xiong, J., MacCready, P., Lesson, A. Impact of estuarine exchange flow on multi-tracer budgets in the Salish Sea (in revision JGR-Oceans)

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.

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.

Xiong, J., Shen, J., Wang, Q. (2022). Storm-induced coastward expansion of *Margalefidinium polykrikides* in Chesapeake Bay. *Marine Pollution Bulletin*, 184, 114187.

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.

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.

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.

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.

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.

Xiong, J., Wang, X. H., Wang, Y. P., Chen, J., Shi, B., Gao, J., Yang, Y., Yu, Q., Li, M., Yang, L., Gong, X. (2017). 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

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 (submitted to JGR-Oceans).

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.

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.

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.

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.

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.

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.

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.

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.

PRESENTATIONS

[24] "Introduction of LiveOcean modles". MG&G seminar, October 2024 (oral).

[23] "Impact of estuarine exchange flow on multi-tracer budgets in the Salish Sea". EPOC, September 2024 (oral).

[22] "Impact of estuarine exchange flow on multi-tracer budgets in the Salish Sea". WHOI COFDAL seminar, August 2024 (oral).

[21] "Impact of estuarine exchange flow on multi-tracer budgets in the Salish Sea". Unifying Innovations in Forecasting Capabilities Workshop (UIFCW24), July 2024 (virtual oral).

[20] "Impact of exchange flow on multi-tracer budgets in the Salish Sea". Ocean Science Meeting, New Orleans, Feb. 2024 (oral + poster).

[19] "Transport dynamics of environmental DNA from a known point source of marine mammals". CERF2023, Portland, Nov. 2023 (poster)

[18] "Intercomparisons of five ocean particle tracking software packages". Gordon Research Conference – Coastal Ocean Dynamics, Rhode Island, Jun. 2023 (poster).

[17] "Biophysical interactions control the progression of harmful algal blooms in the lower Chesapeake Bay". Gordon Research Seminar, Jun. 2023 (invited talk).

[16] Ecological Dissertations in the Aquatic Sciences (Eco-DAS) 2023 March in Honolulu, Hawaii. (invited participant)

[15] "Biophysical interactions control the progression of harmful algal blooms in the lower Chesapeake Bay". Seminar at UW Physical Oceanography, Nov. 2022 (Talk).

[14] "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 (Talk).

[13] "Vertical transport timescale of surface produced particulate material in the Chesapeake Bay". Chesapeake Community Research Symposium, Jun. 2022 (Talk).

[12] "Vertical transport timescale of surface produced particulate material in the Chesapeake Bay". Ocean Science Meeting, virtual meeting, Mar. 2022 (Talk).

[11] "Developing an individual-based model for *Margalefidinum Polykrikoides* blooms in the lower Chesapeake Bay via coupled hydrodynamic model, algal behaviors, and satellite data". Physical Department Seminar of VIMS, Feb. 2022 (Talk).

[10] "Long-term water exchange and material transport in Chesapeake Bay". CERF2021, 26th Biennial Conference, virtual meeting, Nov. 2021 (Talk).

[9] "Bathymetry controls on water reflux and material transport in Chesapeake Bay". Physical Department Seminar of VIMS, Mar. 2021 (Talk).

[8] "Transport pathway and timescale of dissolved and particulate materials from diverse sources in Chesapeake Bay". Chesapeake Community Research Symposium, virtual meeting, Jun. 2020 (Talk).

[7] "A study of water exchange and material transport in Chesapeake Bay". Physical Department Seminar of VIMS, Mar. 2020 (Talk).

[6] "Origins and transport pathway of deep channel material in Chesapeake Bay". Ocean Science Meeting, San Diego, California, Feb. 2020 (Poster).

[5] "Effects of discharge and wind on exchange flow and residence time in Chesapeake Bay". CERF2019, 25th Biennial Conference, Mobile, Alabama, Nov. 2019 (Talk).

[4] "Mechanisms of high SSC and its influence on turbulence dissipation in the Southern Yellow Sea". 14th Annual Meeting Asia Oceania Geosciences Society, Singapore, Aug. 2017 (Talk).

[3] "Mechanisms of high suspended sediment concentration over a tide-dominated offshore shoal in the southern Yellow Sea". 13th Annual Meeting Asia Oceania Geosciences Society, Beijing, China, Aug. 2016 (Poster).

[2] "Mechanisms of high suspended sediment concentration in the southern Jiangsu coast". 4th Conference on Earth System Science, Shanghai, China, Jul. 2016 (Talk).

[1] "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, Zhoushan, China, Oct. 2015 (Poster).

SKILLS

- Experienced in numerical simulation and well trained in both unstructured grid model (SCHISM) and structured grid models (ROMS, EFDC).
- Experienced in various programming languages: MATLAB, Python, Fortran.
- Familiar with working on HPC and Linux computing environments.

AWARDS

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)
Outstanding Graduate Thesis Award of Jiangsu Province, China (2019)
CERF 2021 Participation Award (2021)
Student Travel Grant, VIMS (2019, 2021, 2022)
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)

PROFESSIONAL ACTIVITIES

Journal Review
Continental Shelf Research
EGUsphere
Estuarine, Coastal and Shelf Science
Frontiers in Marine Science
Journal of Geophysical Research: Oceans
Marine Ecology Progress Series
Marine Geology
Marine Pollution Bulletin
Ocean and Coastal Research
Progress in Oceanography
Scientific Report

CERF2021 and 2023 student poster and oral presentation judge
Moderator for three sessions at Ocean Science Meeting, 2024