

# JIABI DU

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## **EDUCATION**

**Ph.D.** in Physical Oceanography, August 2017, Virginia Institute of Marine Science, College of William and Mary, Williamsburg, VA, USA

**Master of Science** in Oceanography, July 2012, Nanjing University, Nanjing, China

**Bachelor of Science** in Physical Geography, July 2010, Nanjing University, Nanjing, China

## **ACADAMIC APPOINTMENTS**

*2023-present* **College of Marine Sciences and Maritime Studies, Texas A&M University**

Assistant Professor, Department of Marine and Coastal Environmental Science

*2023-present* **College of Arts and Sciences, Texas A&M University**

Faculty with joint appointment, Department of Oceanography

*2022-2022* **Virginia Institute of Marine Science, College of William and Mary**

Senior marine scientist

*2019-2021* **Woods Hole Oceanography Institution**

Postdoc Investigator, Applied Ocean Physics & Engineering Department

*2017-2019* **Texas A&M University at Galveston**

Postdoc Research Associate, Department of Marine Science

## **RESEARCH INTERESTS**

I am a coastal physical oceanographer and numerical model developer. My research focuses on the transport and exchange of materials between coastal bays, shelf seas, and deep ocean using in situ measurements, remote sensing data, and idealized and realistic numerical models. I am especially interested in how coastal systems respond to and recover from extreme weather events such as hurricanes. Other previous research topics include: flooding during storm events, impact of sea-level rise and climate warming, cross-shelf exchange induced by meso-scale eddies, physical control on coastal hypoxia, transport of fish larvae and pollutants, sediment transport, etc.

Google Scholar: <https://scholar.google.com/citations?user=OawwXk0AAAAJ&hl=en>

## **EXTERNAL GRANTS AWARDED**

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- (5) 2023: **Environmental Protection Agency (EPA)** “A tributary model for the Choptank River” (co-PI, \$249,972; \$50,000 to TAMU)
  - (4) 2023: **National Science Foundation (NSF)** “Collaborative Research: A hydrological seesaw and its effect on alkalinity dynamics in estuaries along a climate gradient”, (PI, \$ 213,648)
  - (3) 2023: **Texas Water Development Board (TWDB)** “Development of a cross-scale hydrodynamic model for all Texas coastal waters”, (PI, \$137,650)
  - (2) 2023: **Center for Simulator Maritime Training**, “Hydrodynamic data for cruise training”, (PI, \$10,000)

- (1) 2022: **U.S. Coastal Research Program (USCRP)**, “Microplastics(R)Us – Sources and transport pathways of microplastics in a coastal estuary”, (Co-PI; led by Karl Kaiser; \$287,348)

## AWARDS

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Best student paper of 2018 at VIMS, PhD category (2019)  
Institutional Postdoc Fellowship, Texas A&M University at Galveston (2017-2019)  
First Place of Presentation Awards, Chinese Society for Oceanology and Limnology (2015)  
Outstanding Graduates Awards, Nanjing University (2010)  
National Inspiration Scholarship, Nanjing University (2007, 2008)  
Zengxianzi Scholarship, Nanjing University (2007, 2008, 2009)

## PUBLICATIONS (\* indicate student paper)

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- [44] **J. Du**, C.K. Tepolt, E.W. Grason, P.S. McDonald, Y. Jia, W.G. Zhang (2024). Dispersal pathways of European green crab larvae into and throughout the eastern Salish Sea. *Progress in Oceanography*, 223, 103245
- [43] J. Shen, Z. Wang, **J. Du**, Y.J. Zhang, Q. Qin (2024). Machine learning-based wave model with high spatial resolution in Chesapeake Bay. *Earth and Space Science*, 11 (3), e2023EA003303
- [42] W. Huang, F. Ye, Y.J. Zhang, J. Du, K. Park, H.C. Yu, Z. Wang (2024). Hydrodynamic responses of estuarine bays along the Texas-Louisiana coast during Hurricane Harvey. *Ocean Modelling*, 187, 202302
- [41\*] E. Summers, **J. Du**, K. Park, K. Kaiser (2023). How does buoyancy behavior impact microplastic transport in an estuarine environment? *Science of The Total Environment*, 165687
- [40] Y. Shi, X. Xu, G. Yang, **J. Du** et al. (2023). High-Resolution Records of Millennial-Scale East Asian Winter Monsoon in the Shelf Sea of Eastern China. *Geophysical Research Letters*, 50 (7), e2022GL102302
- [39] X. Yu, J. Shen, G. Zheng, **J. Du** (2022). Chlorophyll-a in Chesapeake Bay based on VIIRS satellite data: Spatiotemporal variability and prediction with machine learning. *Ocean Modelling*, 180, 102119
- [38] **J. Du**, W. Zhang, Y. Li (2022). Impact of Gulf Stream Warm-core Rings on Slope Water Intrusion into the Gulf of Maine. *Journal of Physical Oceanography*, 52, 1797-1815
- [37] J. Shen, J. Du, L.V. Lucas (2022). Simple relationships between residence time and annual nutrient retention, export, and loading for estuaries. *Limnology and Oceanography*, 67 (4), 918-933
- [36] T. Dellapenna, C. Hoelscher, L. Hill, V. Bartlett, M. Bell, M.E. Al Mukaimi, **J. Du**, K. Park, A.H. Knap (2021). Hurricane Harvey delivered a massive load of mercury rich sediment to Galveston Bay, Texas, USA. *Estuaries and Coasts*, doi:10.1007/s12237-021-00990-7.
- [35] H. Gancel, R. Carmichael, **J. Du**, K. Park (2021). Use of settlement patterns and geochemical tagging to test population connectivity of eastern oysters (*Crassostrea virginica*) in a freshwater-influenced estuary. *Marine Ecology Progress Series*, 673, 85-105.
- [34] E. Wugaft, Z.A. Wang, J.H. Churchill, T. Dellapenna, S. Song, **J. Du**, M.C. Ringham, T. Rivlin, B. Lazar (2021). Particle triggered reactions as an important mechanism of

alkalinity and inorganic carbon removal in river plumes. *Geophysical Research Letters*, 48, e2021GL093178.

- [33] **J. Du**, W.G. Zhang, Y. Li (2021). Variability of deep water in Jordan Basin of the Gulf of Maine: Influence of Gulf Stream warm core rings and the Nova Scotia Current. *Journal of Geophysical Research: Oceans*, 126, 2020JC017136.
- [32] **J. Du**, K. Park, C. Jensen, T. Dellapenna, W. Zhang, Y. Shi (2021). Massive oyster kill in Galveston Bay caused by prolonged low-salinity exposure after Hurricane Harvey. *Science of the Total Environment*, 774, 145132.
- [31] J. Li, X. Chen, I. Townend, B. Shi, **J. Du**, J. Gao, X. Chuai, Z. Gong, Y.P. Wang (2021). A comparison study on the sediment flocculation process between a bare tidal flat and a clam aquaculture mudflat: The important role of sediment concentration and biological processes. *Marine Geology*, 434, 106443.
- [30] X. Yu, J. Shen, **J. Du** (2021). An inverse approach to estimate bacterial loading into an estuary by using field observations and residence time. *Marine Environmental Research*, 166, 105263.
- [29] W. Huang, F. Ye, Y.J. Zhang, K. Park, **J. Du**, S. Moghimi, E. Myers, S. Pe'eri, J.R. Calzada, H.C. Yu, K. Nunez, Z. Liu (2021). Compounding factors for extreme flooding around Galveston Bay during Hurricane Harvey. *Ocean Modelling*, 158, 101735.
- [28] J. Xiong, J. Shen, Q. Qin, **J. Du** (2021). Water exchange and its relationships with external forcings and residence time in Chesapeake Bay. *Journal of Marine Systems*, 215, 103497.
- [27] X. Yu, J. Shen, **J. Du** (2020). A machine-learning-based model for water quality in coastal waters, taking dissolved oxygen and hypoxia in Chesapeake Bay as an example. *Water Resource Research*, 56, e2020WR027227.
- [26] J. Li, Y.P. Wang, **J. Du**, F. Luo, P. Xin, J. Gao, B. Shi, X. Chen, S. Gao (2020). Effects of *Meretrix meretrix* on sediment thresholds of erosion and deposition on an intertidal flat. *Ecology & Hydrobiology*, 21, 129-141.
- [25] G. Cheng, Y.P. Wang, G. Voulgaris, **J. Du**, J. Sheng, J. Xiong, J. Gao, Y. Yang (2020). Sediment exchange between channel and sand ridges in the southern Yellow Sea. *Continental Shelf Research*, 205, 104169.
- [24] Y. Chen, Q. He, J. Shen, **J. Du** (2020). The alteration of lateral circulation under the influence of human activities in a multiple channel system, Changjiang Estuary. *Estuarine, Coastal, and Shelf Science*, 242, 106823.
- [23] Y.J. Zhang, F. Ye, H. Yu, W. Sun, S. Moghimi, E. Myers, K. Nunez, R. Zhang, H.V. Wang, A. Roland, **J. Du**, Z. Liu (2020). Simulating compound flooding events in a hurricane. *Ocean Dynamics*, 70, 621-640.
- [22] F. Ye, Y.J. Zhang, H. Yu, W. Sun, S. Moghimi, E. Myers, K. Nunez, R. Zhang, H.V. Wang, A. Roland, K. Martins, X. Vertin, **J. Du**, Z. Liu (2020). Simulating storm surge and compound flooding events with a creek-to-ocean model: Importance of baroclinic effects. *Ocean Modelling*, 145, 101526.
- [21] **J. Du**, K. Park, X. Yu, Y.J. Zhang, F. Ye (2020). Massive pollutants released to Galveston Bay during Hurricane Harvey: Understanding their retention and pathway using Lagrangian numerical simulations. *Science of the Total Environment*, 704, 135364.
- [20] D. Chen, T. Lang, Y. Pei, **J. Du**, Y.P. Wang, J. Gao (2019). Hydrodynamics and sediment transport in response to sequential reclamations over subtidal waters near Tianjin Port. *Marine Sciences*, 43, 113-125 (in Chinese with English abstract).

- [19] F. Ye, Y.J. Zhang, R. He, Z. Wang, H.V. Wang, **J. Du** (2019). Third-order WENO transport scheme for simulating the baroclinic eddying ocean on an unstructured grid. *Ocean Modelling*, 143, 101466.
- [18] Z. Wang, H. Wang, J. Shen, F. Ye, Y. Zhang, F. Cai, Z. Liu, **J. Du** (2019). An analytical phytoplankton model and its application in the tidal freshwater James River. *Estuarine, Coastal and Shelf Science*, 224, 228-244.
- [17] Y. Shi, J.H. Gao, H. Sheng, **J. Du**, J.J. Jia, Y.P. Wang, J. Li, F.L. Bai, Y.N. Chen (2019). Cross-front sediment transport induced by quick oscillation of the Yellow Sea Warm Current: Evidence from the sedimentary record. *Geophysical Research Letters*, 6, 226–234.
- [16] **J. Du**, K. Park, J. Shen, Y.J. Zhang, X. Yu, F. Ye, Z. Wang, N.N. Rabalais (2019). A hydrodynamic model for Galveston Bay and the shelf in the northwestern Gulf of Mexico. *Ocean Science*, 15, 951-966.
- [15] **J. Du**, K. Park (2019). Estuarine salinity recovery from an extreme precipitation event: Hurricane Harvey in Galveston Bay. *Science of the Total Environment*, 670, 1049-1059.
- [14] **J. Du**, K. Park, T.M. Dellapenna, J.M. Clay (2019). Dramatic hydrodynamic and sedimentary responses in Galveston Bay and adjacent inner shelf to Hurricane Harvey. *Science of the Total Environment*, 653, 554-564.
- [13] **J. Du**, B. Shi, J. Li, Y.P. Wang (2019). Muddy coast off Jiangsu, China: physical, ecological, and anthropogenic processes. In *Sediment Dynamics of Chinese Muddy Coasts and Estuaries* (X. Wang, ed.), Academic Press, pp. 25-49.
- [12] F. Ye, Y.J. Zhang, H.V. Wang, M.A.M. Friedrichs, I.D. Irby, E. Alteljevich, A. Valle-Levinson, Z. Wang, H. Huang, J. Shen, **J. Du** (2018). A 3D unstructured-grid model for Chesapeake Bay: Importance of bathymetry. *Ocean Modelling*, 127, 16-39.
- [11] **J. Du**, K. Park, J. Shen, B. Dzwonkowski, X. Yu, B. Yoon (2018). Role of baroclinic processes on flushing characteristics in a highly stratified estuarine system, Mobile Bay, Alabama. *Journal of Geophysical Research: Oceans*, 123, 4518-4537.
- [10] J. Xiong, Y.P. Wang, S. Gao, **J. Du**, Y. Yang, J. Tang (2018). Estimation of near-bed wave orbital velocities and wave-related shear stresses using in situ measurements. *Limnology & Oceanography: Methods*, 16, 594-606.
- [9] **J. Du**, J. Shen, K. Park, Y.P. Wang, X. Yu (2018). Worsened physical condition due to climate change contributes to the increasing hypoxia in Chesapeake Bay. *Science of the Total Environment*, 630, 707-717.
- [8] **J. Du**, J. Shen, Y.J. Zhang, F. Ye, Z. Liu, Z. Wang, Y.P. Wang, X. Yu, M. Sisson, H.V. Wang (2018). Tidal response to sea-level rise in different types of estuaries: the importance of length, bathymetry, and geometry. *Geophysical Research Letters*, 45, 227-235.
- [7] **J. Du**, J. Shen (2017). Transport of riverine material from multiple rivers in the Chesapeake Bay: Important control of estuarine circulation on the material distribution. *Journal of Geophysical Research: Biogeosciences*, 122(11), 2998-3103.
- [6] **J. Du**, J. Shen, D.M. Bilkovic, C.H. Hershner, M. Sisson (2017). A numerical modeling approach to predict the effect of a storm surge barrier on hydrodynamics and long-term transport processes in a partially mixed estuary. *Estuaries and Coasts*, 40(2), 387-403.
- [5] **J. Du**, J. Shen (2016). Water residence time in Chesapeake Bay for 1980–2012. *Journal of Marine Systems*, 164, 101-111.

- [4] **J. Du**, J. Shen (2015). Decoupling the influence of biological and physical processes on the dissolved oxygen in the Chesapeake Bay. *Journal of Geophysical Research: Oceans*, 120(1), 78-93.
- [3] **J. Du**, Y. Wang (2014). Evolution simulation of radial sand ridges in the southern Yellow Sea. *Journal of Nanjing University: Natural Sciences*, 50(5), 636-645 (in Chinese with English abstract).
- [2] X. Yu, **J. Du**, J. Gao, Y. Yang, J. Ran, F. Li, Y. Liu, Y. Cheng (201). The influence of hydrodynamic characteristics on the distribution of chlorophyll concentration in the maximum turbidity of the Yalu Estuary. *Acta Oceanologica Sinica*, 34(2), 101-113 (in Chinese with English abstract).
- [1] **J. Du**, Y. Pei, J. Gao, X. Yu, F. Wang, C. Fan, H. Wang, Y. Wang (2012). The suspended sediment transport associated with low flow patterns in shallow waters: a case study from the Tianjin subtidal area. *Acta Oceanologica Sinica*, 34(1), 136-144 (in Chinese with English abstract).

#### PhD Dissertation

- J. Du** (2017). Impact of climate variation and human adaptation on the physical transport processes and water exchange in Chesapeake Bay. College of William and Mary.

#### PRESENTATIONS

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- [20] “Variability of deep water in Gulf of Maine: influence of Gulf Stream, warm-core rings, and Nova Scotia Current”, Woods Hole Oceanographic Institution, January 22, 2021
- [19] “Why bottom water in Gulf of Maine is persistently warmer in winter than in summer?”, Ocean Science Meeting (poster), San Diego, CA, February 18, 2020
- [18] “Dramatic Physical and Sedimentary Responses to Hurricane Harvey, the Wettest Tropical Storm in US History: An Interdisciplinary Study Using Observational and Numerical Approaches”, Woods Hole Oceanographic Institution, December 18, 2019
- [17] “Dramatic estuarine responses to hurricane Harvey, the wettest tropical storm in US history - an interdisciplinary study using observational and numerical approaches”, Virginia Institute of Marine Science (VIMS), Gloucester, VA, November 14, 2019
- [16] “Dramatic estuarine response to hurricane Harvey, the wettest tropical storm in US history: observational and numerical approaches”, 2019 WHOI Postdoctoral Symposium, October 10, 2019
- [15] “Hydrodynamic and sedimentary responses to a category 4 hurricane, Harvey”, 1st Young Scientist Symposium at Hohai University (invited), Nanjing, Jiangsu, China, December 21, 2018
- [14] “Hydrodynamic and sedimentary responses to a category 4 hurricane, Harvey”, Nanjing University (invited), Nanjing, Jiangsu, China, December 20, 2018

- [13] “Dramatic estuarine response to Hurricane Harvey in Galveston Bay: observational and numerical approaches”, Gulf Estuarine Research Society Meeting, Galveston, TX, November 9, 2018
- [12] “A cross-scale numerical model for the Northwestern Gulf of Mexico”, Physics of Estuaries and Coastal Seas Meeting (Poster), Galveston, TX, October 17, 2018
- [11] “Modelling the dramatic estuarine responses in Galveston Bay to Hurricane Harvey”, Hurricane Harvey Research Symposium, Port Aransas, TX, August 23, 2018
- [10] “Understand the physical and biological controls on hypoxia in Chesapeake Bay: using long-term monitoring data and numerical modeling”, Texas A&M University at Galveston, Galveston, TX, February 8, 2018.
- [9] “Tidal asymmetry and its relation with sediment transport in Bohai, Yellow, East, and South China Sea”, CERF Conference (Poster), Providence, RI, November 8, 2017
- [8] “Water Residence time in the Chesapeake Bay from 1980-2012”, VIMS, Gloucester, VA, August 11, 2016
- [7] “A Numerical Modeling Approach to Predict the Effect of a Storm Surge Barrier on Hydrodynamics and Long-Term Transport Processes in a Partially Mixed Estuary”, Chesapeake Modeling Symposium, Williamsburg, VA, June 1, 2016
- [6] “Decoupling the influence of biological and physical processes on the dissolved oxygen in the Chesapeake Bay”, Ocean Science Meeting, New Orleans, LA, February 24, 2016
- [5] “The importance of physical transport on water quality in the Chesapeake Bay”, Zhuhai Symposium invited by Sun Yat-sen University, Zhuhai, China, December 20, 2015
- [4] “Long-term vertical transport process in the Chesapeake Bay and its impact on dissolved oxygen”, CERF Conference (Poster), Portland, OR, November 10, 2015
- [3] “Numerical simulation of the vertical transport processes in the Chesapeake Bay for the past 3 decades”, Annual Meeting of Chinese Society for Oceanology and Limnology, Changsha, China, April 19, 2015
- [2] “Decoupling of physical and biological processes to assess the influence of long-term hydrodynamic variations on the change of hypoxia levels in the Chesapeake Bay”, Physical Science Department Seminar in VIMS, Gloucester, VA, June 12, 2014
- [1] “Decoupling of physical and biological processes to assess the influence of long-term hydrodynamic variations on the change of hypoxia levels in the Chesapeake Bay”, Chesapeake Modeling Symposium, Annapolis, MD, May 28, 2014

## **PROFESSIONAL ACTIVITIES**

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### *PROPOSAL REVIEW*

Reviewed proposals for

National Science Foundation

Coastal Hypoxia Research Program (CHRP), NOAA’s National Centers for Coastal Ocean Science

North Carolina Sea Grant

Maryland Sea Grant

*JOURNAL REVIEW*

Reviewed manuscripts for journals including *Earth Science Review*, *Geophysical Research Letters*, *Science of the Total Environment*, *Journal of Geophysical Research: Oceans*, *Ocean Engineering*, *Marine Pollution Bulletin*, *Journal of Marine Systems*, *Marine Geology*, *Estuarine, Coastal and Shelf Science*, *Water Resources Research*, *Water*, *Marine Ecology Progress Series*, *International Journal of Sediment Research*, *Continental Shelf Research*, *Ocean Sciences*, *Journal of Asian Earth Science*, *Journal of Waterway, Port, Coastal and Ocean Engineering*, *Estuaries and Coasts*

*EDITORIAL ACTIVITIES*

Guest Editor for journal *Water* since 04/01/2021

Guest editor for a special issue "Salt water intrusion in coastal areas" in journal *Water*