Linlin Cui

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Research Interests

Numerical Modeling
Dynamics of coastal and estuarine circulation
Estuarine stratification and turbulence mixing
Bio-physical interaction and ecosystem modeling
Biogeochemical processes in estuaries and shelves
Sediment transport modeling

Education

Ph.D. in *Physical Oceanography*, Louisiana State University, 2018
Thesis: Tidal-, Wind-, and Buoyancy-Driven Dynamics in Barataria Estuary and Its Impact on Estuarine-Shelf Exchange Processes

M.S. in *Computer Science,* Louisiana State University, 2018

M.S. in *Fishery Resources*, Shanghai Ocean University, 2013
Thesis: Numerical Simulation of Impact of Air-Sea Interaction on Cyclone over the East China Sea

B.S. in *Marine Science*, Nanjing University of Information Science and Technology, 2010
Thesis: Simulation of Impact of Thermohaline Circulation on the East Asian Monsoons

Professional Experience

02/2019-present	**Postdoctoral Research Associate**
	Virginia Institute of Marine Science (VIMS), Gloucester Point, VA

- Developing three-dimensional coastal compound flooding prediction system with SCHISM (Python, Fortran)
- Modified HydroBioSed model within COAWST to investigate the benthic fluxes of DIC and TA on ocean acidification in the northern Gulf of Mexico (Fortran)
- Developed Oil-Particle-Aggregates (OPAs) module within COAWST to account for oil-sediment interaction (Fortran)

08/2013-12/2018	**Research Assistant**
	Louisiana State University, Baton Rouge, LA

- Created and configured a hydrodynamic model (FVCOM) covering the Barataria Estuary and Texas-Louisiana shelf
- Studied the impact of river diversions on estuary salinity
- Investigated the lateral circulation in a tidal inlet
- Examined dynamics of river plumes in inner shelf of Louisiana shelf

09/2010-06/2013	**Research Assistant**
	Shanghai Ocean University, Shanghai, China

- Configured the Eastern China Sea Weather Research and Forecasting Model (WRFV3.2)
- Implemented COARE3.0 algorithm into WRF to improve heat fluxes

Honors/Awards

2019	Committee on Sustainability Professional Development Award, William & Mary
2019	Student/Early Career Travel Award, Coastal and Estuarine Research Federation (CERF)

2017-2018	Economic Development Assistantship, Louisiana State University
2016	Graduate School Dean's Travel Award, Louisiana State University
2011	First-class scholarship, Shanghai Ocean University
2010	Outstanding graduate student, Nanjing University of Information Science and Technology
2007-2009	National Encouragement Scholarship, Nanjing University of Information Science and Technology
2007-2010	Merit student, Nanjing University of Information Science and Technology
2008-2010	Excellence student leader, Nanjing University of Information Science and Technology
2007	First-class scholarship, Nanjing University of Information Science and Technology

Publications

Ye, F., **Cui, L.**, Zhang, Y., Wang, Z., Moghimi, S., Myers, E., Seroka, G., Zundel, A., Mani, S. and Kelley, G.W. A parallel python-based tool for meshing watershed rivers at continental scale. (Submitted to Environmental Modelling and Software)

Zhang, Y. J., Fernandez-MontBlanc, T., Pringle, W., Yu, H.-C**., Cui, L.** and Moghimi, S. (2022), Global seamless tidal simulation using a 3D unstructured-grid model. Geoscientific Model Development Discussions. (Under review)

Xiong, J., Shen, J., Qin, Q., Tomlinson, M.C., Zhang, Y.J., Cai, X., Ye, F., **Cui, L.** and 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. Limnol. Oceanogr. Lett. https://doi.org/10.1002/lol2.10308

Cui, L., Harris, C.K., and Tarpley, D.R.N. 2021. Formation of Oil-Particle-Aggregates: Numerical Model Formulation and Calibration. *Front. Mar. Sci.* 8:629476. https://doi.org/10.3389/fmars.2021.629476

Cui, L., Huang, H., Li, C. and Justic, D. 2018. Lateral Circulation in a Partially Stratified Tidal Inlet. *J. Mar. Sci. Eng.*, 6, 159. https://doi.org/10.3390/jmse6040159

Hu, S., **Cui, L.**, Liu, H., and Zhu, M. 2012. Sensitivity of Air-Sea Flux to Microphysical Schemes and Planetary Boundary Layer Parameterizations in WRF during the Cyclone Passage. Journal of Shanghai Ocean University.

Cui, L., and Hu, S. 2012. Analysis on Difference of Sea Surface Wind Field between WRF and QuickSCAT over the East China Sea of 2008. Marine Forecasts.

Presentations/Conferences

Cui, L., C.K. Harris, W.J. Cai, K. Maiti. Numerical modeling of sediment biogeochemical processes over Louisiana continental shelf. Seminar at Virginia Institute of Marine Science. February, 2020.

Cui, L., C.K. Harris, W.J. Cai, K. Maiti. Numerical modeling of the impact of sediment driven processes on bottom water chemistry over Louisiana continental shelf. Oral presentation at the 2020 Ocean Sciences Meeting. San Diego, CA. February, 2020.

Harris, C.K., L. Cui, and D. S. Dukhovskoy. Oil particle aggregation model for the Gulf of Mexico continental shelf: scenario testing. Poster presented at the 2020 Ocean Sciences Meeting. San Diego, CA. February, 2020.

Cui, L., C.K. Harris, K. Maiti, and W.J. Cai. Impact of Sediment Resuspension on Near Bed Dissolved Inorganic Carbon and Acidification in the northern Gulf of Mexico. Oral presentation at the 2019 Biennial Coastal and Estuarine Research Federation (CERF) Conference. Mobile, AL. November, 2019.

Cui, L., C.K. Harris, and D.R. Tarpley. Estimating the Impact of Oil on Flocculation Processes with a New Parameterized Sediment Model. Poster presented at the 2019 Biennial Coastal and Estuarine Research Federation (CERF) Conference. Mobile, AL. November, 2019.

Cui, L., C.K. Harris, and D.R. Tarpley. Estimating the Impact of Oil on Flocculation Processes with a New Parameterized Sediment Model. Poster presented at 2019 Gordon Research Conference on Coastal Research Dynamics. Manchester, NH. June, 2019.

Cui, L., C.K. Harris, and D.R. Tarpley. Estimating the Impact of Oil on Flocculation Processes with a New Parameterized Sediment Model. Poster presented at the Community Surface Dynamics Modeling System (CSDMS) 2019 Annual Meeting. Boulder, CO. May, 2019.

Huang, H., **L. Cui**, and D. Justic. A modeling Study of Tidal- and Wind-Driven Estuary-Shelf Exchange through a Narrow Tidal Inlet: the Barataria Pass, Louisiana. Poster presented at the 2019 Gulf of Mexico Oil Spill and Ecosystem Science Conference. New Orleans, LA. February, 2019.

Cui, L., guest lecture. Virginia Institute of Marine Science, Gloucester Point, VA. November, 2018.

Cui, L., H. Huang, C. Li, and D. Justic. Investigating Controlling Factors of Estuarine Stratification in a Tidal Inlet. Oral presentation at the 15th Estuarine and Coastal Modeling Conference, Seattle, WA. June, 2018.

Huang, H., **L. Cui**, and D. Justic. Assessing the Effects of River Diversions on Estuarine Dynamics and Oil Transport in the Barataria Bay. 2017 Gulf of Mexico Oil Spill and Ecosystem Science Conference. New Orleans, LA. February, 2017.

Huang, H., **L. Cui, S**. Sorourian, and D. Justic. Assessing the Effects of River Diversions on Salinity Gradient, Residence Time, and Sediment Transport in the Barataria Bay. Presented at the 2017 Estuarine Coastal Sciences Association Conference. Shanghai, China. October, 2017.

Cui, L. Graduate Student Symposium, Ocean Springs, MS. March, 2016.

Cui L., and H. Huang. Impact of Mississippi River Diversions on Salinity Gradients and Estuarine Residence Time in Coastal Louisiana: A Numerical Modeling Study. Oral presentation at the 2016 State of the Coast. New Orleans, LA. June, 2016.

Cui L., and H. Huang. Impact of Mississippi River Diversions on Salinity Gradients and Estuarine Residence Time in Coastal Louisiana: A Numerical Modeling Study. 14th Estuarine and Coastal Modeling Conference, Kingston, RI. June, 2016.

Huang, H., **L. Cui**, S. Sorourian, and D. Justic. A Coupled Ocean-Wave Model for the Barataria Bay, Louisiana. Poster presented at the 2016 Gulf of Mexico Oil Spill and Ecosystem Science Conference. Tampa, FL. February, 2016.

Cui, L., and H. Huang. Hurricane IKE (2008) Simulation Experiment Using WRF. Poster presented at the 2014 State of the Coast. New Orleans, LA. March, 2014.

Workshop

Artificial Intelligence for Earth System Science Summer School 2020. Held virtually by the National Center for Atmospheric Research. June 22-26, 2020.

The Coupled-Ocean-Atmosphere-Waves-Sediment-Transport (COAWST) Workshop. Raleigh, NC. Feb. 2019.

The 16th WRF Users' Workshop, 06/2015. Boulder, CO. June, 2015.

Annual LONI Parallel Programming Workshop. Louisiana State University, Baton Rouge, LA. June, 2014.

NVIDIA GPU Programming Workshop. Louisiana State University, Baton Rouge, LA. June, 2014.

Mentoring

Co-Mentor for Jacob Wacht, the College of William and Mary SMS/VIMS Summer Internship Program 2019.

Mentored undergraduate thesis, 2012.

Journal Article Reviews

Water, Water Resources Research, Journal of Marine Science and Engineering, Frontiers in Water

Outreach

2019 Ocean Science Day at Virginia Institute of Marine Science

Professional Affiliations

American Geophysical Union
The Oceanography Society
Coastal and Estuarine Research Federation
Community Surface Dynamics Modeling System

Skills

- Numerical Models: FVCOM, ROMS, SCHISM, WRF
- Programming Language: Python, Fortran, Shell scripting, Java, Open MPI parallel programming
- Database: MySQL, Postgres
- Public Cloud Platform: Amazon Web Services, Elastic Compute Cloud (EC2), Simple Storage Services (S3)

- Tools: git, Docker, Kubernetes