

## Qianqian Liu, Ph.D.

Physics and Physical Oceanography  
University of North Carolina Wilmington  
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### Research Interests

Coupled Physical-biogeochemical/Ecological Simulation; HABs tracking; HABs Toxicity Forecast; Numerical Modeling and Data Assimilation; Dynamics of Coastal Ocean, Estuaries and the Great Lakes

### Education

Ph.D., Physical Oceanography, University of Rhode Island 05/2015 Narragansett, RI  
*Thesis:* Dynamics of Rhode Island Coastal Waters.

M.S., Physical Oceanography, University of Rhode Island 12/2011 Narragansett, RI  
*Thesis:* A Modeling Study of the Seasonal Variability of the Circulation in Rhode Island Sound.

B.S., Marine Science, Ocean University of China 06/2009 Qingdao, China  
*Thesis:* Wave Generation over the Northeastern Coastal Waters of Taiwan during Typhoon Bilis in 2000.

### Professional Experience

01/2020 – **Assistant Professor**  
University of North Carolina Wilmington

12/2016 – 01/2020 **Postdoctoral Research Fellow**  
NOAA Great Lakes Environmental Research Laboratory (GLERL)  
@ University of Michigan, Ann Arbor, MI  
@ Grand Valley State University, Muskegon, MI

06/2015 – 12/2016 **Postdoctoral Research Associate**  
School of Marine Science, University of Maine, Orono, ME

### Publications

Zhou, X., P. Xue, Q. Liu, M.D., Row. (2023). Comparison of Eulerian and Lagrangian transport models for harmful algal bloom forecasts in Lake Erie. *Environmental Modelling & Software*. Accepted.

Chen, D., X. Wang, M. Hou, Q. Wang, Q. Liu, H. Huang, Y. Zhang. (2022). Carbon transfer efficiency and risk of fisheries collapse in three large marine ecosystems around China. *Frontiers in Marine Science*.  
<https://doi.org/10.3389/fmars.2022.863611>.

Chen, D., L. Zeng, K. Boot, Q. Liu. (2022). Satellite observed spatial and temporal variabilities of particulate organic carbon in the East China Sea. *Remote Sensing*. 14(8), 1799.

Liu, Q., H. Xue, F. Chai, Z. Wang, Y. Chao, S. Rao, H. Zhang, Y. Zhang. (2022). How winds and river discharge affect circulation in a mesotidal estuary, San Francisco Bay, USA. *EarthArXiv*.  
<https://doi.org/10.31223/X5RP85>

Qian, S., C. A. Stow, F. E. Rowland, Q. Liu, M. D. Rowe, E. J. Anderson, R. P. Stumpf, T. H. Johengen (2021). Chlorophyll a as an indicator of microcystin: short-term forecasting and risk assessment in Lake Erie. *Ecological Indicators*. 130, 108055.

Liu, Q., M. D. Rowe, E. J. Anderson, C. A. Stow, R. P. Stumpf, and T. H. Johengen (2020). Probabilistic forecast of microcystin toxin using satellite remote sensing, *in situ* observations and numerical modeling. *Environmental Modelling & Software*. <https://doi.org/10.1016/j.envsoft.2020.104705>

- Wang, Z., F. Chai, Q. Liu, H. Xue, et al. (2020). The interannual variabilities of chlorophyll and nutrients in San Francisco Bay: A model study. *Ocean Dynamics*. 70, 1169-1186
- Chen, D., Q. Liu, K. Yin (2021). Numerical study of the Three Gorges Dam influences on chlorophyll-a in the Changjiang Estuary and the adjacent East China Sea. *Journal of Ocean University of China*. 20, 10-22.
- Stow, C. A., Q. Liu, and E. J. Anderson (2019). Nutrient loading and nonstationarity: The importance of differentiating the independent effects of tributary flow and nutrient concentration. *Wiley Interdisciplinary Reviews: Water*. <https://doi.org/10.1002/wat2.1396>
- Chen, D., Q. Liu, J. Xu, and K. Wang (2019). Model-based evaluation of hydroelectric dam's impact on the seasonal variabilities of POC in coastal ocean: A case study of Three Gorges Project. *Journal of Marine Science and Engineering*. <https://doi.org/10.3390/jmse7090320>
- Liu, Q., E. J. Anderson, et al. (2018). Modeling Reveals the Role of Coastal Upwelling and Hydrologic Inputs on Biologically Distinct Water Exchanges in a Great Lakes Estuary. *Estuarine, Coastal and Shelf Science*. 209, 41-55. <https://doi.org/10.1016/j.ecss.2018.05.014>.
- Liu, Q., S. Rao, F. Chai, R. Dugdale, F. Wilkerson and Y. Chao (2018). San Francisco Bay nutrients and plankton dynamics as simulated by a coupled hydrodynamic-ecosystem model. *Continental Shelf Research*. <https://doi.org/10.1016/j.csr.2018.03.008>.
- Biddanda, B. A., A. D. Weinke, S.T. Kendall, L.C. Gereaux, T.M. Holcomb, M.J. Snider, D.K. Dila, S.A. Long, C. VandenBerg, K. Knapp, D.J. Koopmans, K. Thompson, J.H. Vail, M.E. Ogdahl, Q. Liu, T.J. Johengen, E.J. Anderson, and S.A. Ruberg (2018). Chronicles of Hypoxia: Time-series buoy observations reveal annually recurring seasonal basin-wide bottom water hypoxia in Muskegon Lake Area of Concern - a Great Lakes estuary. *Journal of Great Lakes Research*. 44(2), 219-229.
- Liu, Q., L. Rothstein and Y. Luo (2017). A Periodic Freshwater Patches Detachment Process From the Block Island Sound Estuarine Plume. *Journal of Geophysical Research: Oceans*. 122(1), 570-586, doi:10.1002/2015JC011546.
- Liu, Q., L. Rothstein, Y. Luo, D. Ullman and D. Codiga (2016). Dynamics of Periphery Current in Rhode Island Sound. *Ocean Modelling*. 105, 13-24. doi:10.1016/j.ocemod.2016.07.001.
- Liu, Q., L. Rothstein and Y. Luo (2016). Dynamics of the Block Island Sound Estuarine Plume. *Journal of Physical Oceanography*. 46(5), 1633-1656, <http://dx.doi.org/10.1175/JPO-D-15-0099.1>.
- Hou, F., X. Bao, B. Li, and Q. Liu (2015). The assessment of extractable tidal energy and the effect of tidal energy turbine deployment on the hydrodynamics in Zhoushan. *Acta Oceanologica Sinica*, 34(5), 86-91.
- Luo, Y., L. Rothstein, Q. Liu, and S. Zhang (2013). Climatic variability of the circulation in the Rhode Island Sound: A modeling study. *Journal of Geophysical Research: Oceans*, 118(9), 4072-4091.

## Presentations

- 02/2022 Oral: Probabilistic forecast of an algal toxin using remote sensing, in situ observations and numerical model. Ocean Science Meeting. Virtual
- 12/2021 Oral: Spatial and temporal variabilities of CHABs estimation in Albemarle Sound, NC. AGU Fall Meetings. Hybrid
- 06/2021 Oral: Harmful Algal Bloom assessment of Albemarle Sound. The Albemarle-Pamlico National Estuary Partnership Meeting, Virtual.
- 05/2021 Oral. Probabilistic forecast of microcystin toxin using satellite remote sensing, in situ observations and numerical modeling, the International Association for Great Lakes Research

- (IAGLR) Virtual 2021.
5. 02/2021 Oral: Modelling A Freshwater Estuary Under the Stresses of Anthropogenic Activities and Climate Change. NOAA SCHSIM Boot camp and Workshop, Virtual.
  6. 06/2020 Oral: Probabilistic forecast of microcystin toxin using satellite remote sensing, *in situ* observations and numerical modeling. IAGLR Virtual 2020.
  7. 12/2019 Poster: Probabilistic forecast of microcystin toxin using satellite remote sensing, *in situ* observations and numerical modeling. AGU Fall Meeting; San Francisco, CA
  8. 02/2018 Poster: Biophysical Simulation of a Freshwater Estuary along the Eastern Shore of Lake Michigan. Ocean Science Meeting; Portland, OR
  9. 11/2017 Oral: Modeling A Freshwater Estuary Under the Stresses of Anthropogenic Activities and Climate Change. the 24<sup>th</sup> Coastal Estuarine Research Federation (CERF) Conference; Providence, RI
  10. 05/2017 Oral: A Physical-Biogeochemical Simulation of Muskegon Lake. the 60<sup>th</sup> International Association for Great Lakes Research (IAGLR) Conference; Detroit, MI
  11. 11/2016 Oral: Modeling the San Francisco Bay Ecosystem. 9th Biennial Bay-Delta Science Conference; Sacramento, CA
  12. 06/ 2016 Oral: A Modeling Study of the nutrient and biomass cycles in San Francisco Bay. 14<sup>th</sup> International Conference on Estuarine and Coastal Modeling; Kingston, RI
  13. 04/ 2016 Poster: The nutrient and biomass cycles in San Francisco Bay: A Modeling Study. Interagency Ecological Program Annual Workshop; Folsom, CA
  14. 02/ 2016 Poster: A Modeling Study of the San Francisco Bay and Delta Ecosystem in High and Low River Flow Years. Ocean Science Meeting; New Orleans, LA
  15. 01/2016 **Invited Talk**: Dynamics of Rhode Island Coastal Waters. *Ocean University of China*; Qingdao, China.
  16. 01/2016 Oral: San Francisco Bay and Delta Ecosystem Study. Workshop on Regional Modeling of the Western Pacific and Eastern Indian Oceans; Guangzhou, China
  17. 11/ 2015 Oral: Modeling the circulation in Rhode Island Coastal Waters. the 23<sup>rd</sup> Coastal Estuarine Research Federation (CERF) conference; Portland, OR
  18. 06/2015 Poster: A cyclonic current around the Periphery of Rhode Island Sound. Gordon Research Seminar and Gordon Research Conference; Biddeford, ME
  19. 05/2015 **Invited Talk**: Physical Processes in Rhode Island Coastal Waters. *Woods Hole Oceanographic Institution*; Woods Hole, MA.
  20. 02/ 2015 **Invited Talk**: Seasonal variability of the Block Island Sound Estuarine Plume. *University of Connecticut*; Groton, CT.
  21. 10/ 2013 Oral: Climate variability of the circulation in the Rhode Island Sound: a modeling study. Mid-Atlantic Bight Physical Oceanography and Meteorology (MABPOM) meeting; Narragansett, RI.
  22. 10/ 2013 Poster: How does the Connecticut River influence the circulation, transport and salinity around Block Island Sound? MABPOM; Narragansett, RI.
  23. 11/ 2012 Oral: A modeling study of the seasonal and interannual variability of the circulation in Rhode Island Sound. MABPOM; Groton, CT.
  24. 02/ 2012 Poster: A modeling study of the seasonal variability of the circulation in Rhode Island Sound. Ocean Science Meeting; Salt Lake City, Utah.

## Research Cruises and Experiments

- Summer 2017: Muskegon Lake Observatory Program Design and Deployment
- 10/2010: A comprehensive ocean survey studying Gulf of Maine Euphausiids. Northern flank of Georges Bank, R/V Endeavor
- 04/2010: Jiffy Cruise: Investigation of pH and its effects on the carbon dioxide system. Narragansett Bay, R/V Cap'n Bert

- 12/2009: Circular poiseuille fluid experiment. Narragansett Bay Campus, University of Rhode Island.
- 08/2009: Fluid mechanics experiments including Reynolds number in laminar and turbulent flow and boundary layer flow. Ocean University of China; Qingdao, China.
- 06/2008: Ocean current and seawater quality investigation. Jiaozhou Bay, vessel Qingdaodiao NO.34. China.
- 04/2007: Ocean Investigation. East China Sea, R/V Dongfanghong 2

## Services

**Journal Reviewer:** Journal of Geophysical Research: Ocean, Ocean Modeling, Estuarine, Coastal and Shelf Science, Journal of Coastal Research, Toxins, Journal of Great Lakes Research, Ocean Dynamics, Environmental Science and Pollution Research, Acta Oceanologica Sinica, Chinese Journal of Oceanology and Limnology, etc.

**Mentor:** 2018 and 2019 Great Lakes Summer Fellow Programs by the University of Michigan and NOAA-GLERL, the 24<sup>th</sup> CERF Conference

## Teaching Training/Experience

- Spring 2022: UNCW PHY 575 Physical Oceanography
- Fall 2021: PHY 101 Elementary Physics Lecture and Lab
- Spring 2021: PHY 575 Physical Oceanography
- Fall 2020: UNCW PHY 101 Elementary Physics lecture and lab
- Spring 2020 – UNCW PHY 101 Elementary Physics lecture
- Spring 2019 – Postdoctoral Short-Course on College Science Teaching
- Fall 2009: ELS 512 - Oral Communication Skills for International Teaching Assistants
- Class Lecture on “Mental Inputs to Narragansett Bay: A history and Assessment of Recent Conditions” in Course OCG694: The Ecology of Narragansett Bay
- Class Lecture on “Seasonal Variability of Chlorophyll a in Block Island and Rhode Island Sounds” in Course OCG594: Satellite Oceanography
- Class Lecture on “Anthropogenic effects to the nutrients and planktons in Narragansett Bay” in Course OCG593: Biological Oceanography

## Grants and Awards

- 2023-2024: NSF Collaborative Research: CyberTraining: Pilot: A Cybertraining Program to Advance Data Acquisition, Processing, and Machine Learning-based Modeling in Marine Science. PIs: Q. Liu (PI), Y. Song (Co-PI), Z. Wang (Co-PI), and G. Dogan (Co-PI).
- 2022-2024: NC Sea Grant 2022-2024 Biennial Research Funding Cycle: Assessing influence of sea-level rise induced salt intrusion and associated circulation change on southern flounder recruitment processes in Albemarle-Pamlico Sound. PIs: Qianqian Liu (PI) and Fred Scharf (Co-PI).
- 2020-2021: Implementation of a HAB toxicity forecast system for Lake Erie. PIs: Qianqian Liu and Mark Rowe (NOAA-GLERL)
- 2020-2021: North Carolina Sea Grant Minigrant: Assessment of HAB's Distribution and Intensity in Albemarle and Pamlico Sounds. PI: Qianqian Liu
- 2017-2018 Postdoctoral Fellow: Modeling Recovery: Implementing a 3-D Hydrodynamic Model for a Recovering Great Lakes Estuary (Muskegon Lake AOC) Impacted by Eutrophication, HABs and Hypoxia. CIGLR Post-doctoral Fellowship for Great Lakes Studies. Mentors: Eric Anderson (NOAA-GLERL) and Bopi Biddanda (GVSU).
- 2008: Distribution and variation of global Coriolis-Stokes force based on the 40 years reanalysis data from ECMWF. National Program for Creative Experiment by College Students, PIs: Weili Wang, Qianqian Liu
- 2017 MPOWIR Travel Grant to Pattullo Conference
- 2015 Graduate School of Oceanography Alumni Award

- 2009 Ocean University of China Outstanding Graduates Award
- 2006-2008 Ocean University of China Excellent Students Award
- 2007 National Endeavor Scholarship
- 2007 Scientific and Technological Innovation Award
- 2006-2008 Ocean University of China Excellent Academic Performance Scholarship
- 2006-2008 National Education Foundation in Ocean Science Scholarship
- 2006 National Zhao Yang Award