



## BINGQING LIU, PH.D.

*Research Scientist/Deputy Director of RESTORE Act Center of Excellence for Louisiana*

### COMPANY ROLE

Research  
Scientist/Deputy  
Director of RESTORE  
Act Center of  
Excellence for  
Louisiana

### PROJECT ROLE / FOCUS AREAS

Remote Sensing  
Harmful Algal Bloom  
Carbon  
AI/deep learning  
Water Quality  
Modeling

### EDUCATION

Postdoc, Coastal  
Ecology, The Water  
Institute of the Gulf,  
2021

Ph.D., Oceanography  
& Coastal Sciences,  
Louisiana State  
University, 2020

M.S., Oceanography,  
Shanghai Ocean  
University, 2015

B.S., Oceanography,  
Shanghai Ocean  
University, 2003

Bingqing Liu, Ph.D. brings her experience in oceanography and coastal science to The Water Institute with her research focusing on wetland-estuary biogeochemistry and ocean color remote sensing. She has extensive research experience in monitoring and characterizing river-coastal dynamics including coastal habitat classification, carbon cycling, phytoplankton community dynamics, water qualities in the Gulf of Mexico.

My research dabbles in understanding and characterizing coastal and marine systems and their responses to transient meteorological events, climate changes and human activities. Specific topics I am working on include wetland-estuarine carbon cycling, phytoplankton community dynamics, and harmful algal blooms. The primary methods I use to conduct my research include a combination of field and remote sensing observations (with spatial and temporal analyses), AI/machine learning approach, and ecosystem models at the landscape level are also blended in my research. At the broadest level, her long-term research goal is to understand how anthropogenic impacts and climate change, to conservation and restoration, influence coastal ecosystem dynamics at spatial landscape scale.

In addition to being a research scientist at the Institute, Dr. Liu is the Deputy Director for the RESTORE Act Center of Excellence for Louisiana (LA-COE) where she helps the administration of a competitive coastal research grants program.

Prior to joining the Institute, Dr. Liu earned her Ph.D. in Oceanography and Coastal Sciences at Louisiana State University. In addition, Dr. Liu participated in a NASA Fellowship to attend the "Ocean Optics 2017" training program and an internship at the Applied Physics Laboratory at the University of Washington in Seattle.

### PROFESSIONAL EXPERIENCE

2022-Present: Research Scientist, The Water Institute

2020-2021: I.T. Postdoctoral Research, The Water Institute

2020-Present: Deputy Director, RESTORE Act Center of Excellence for Louisiana

2015-2020: Graduate Research Associate (Ph.D.), Louisiana State University

2014: Internship, University of Washington



## SELECTED PROJECTS

**Coastal Carbon Capture (CPRA TO83) (2021)** Role: engaged in conducting state of science literature review of coastal carbon research in Louisiana and Gulf-wide, analyzing model results from 2017 Coastal Master Plan, developing scripts to extract habitat changes, and calculating net flux of GHG emissions of Louisiana's coastal habitats. The net flux of greenhouse gas emissions based on carbon dioxide equivalency with and without 2017 Coastal Master Plan of the Louisiana coastal area were estimated at years 2005, 2020, 2025, 2030, and 2050 to align with State of Louisiana's Governors' goals.

**Ecosystem Model Runs for Mid-Breton Scenarios (EIS) (Nov. 2021-current)**. Role: developed Habitat Suitability Index (HSI) automation script to prepare HSI input parameters and calculate HSI, analyzed the model results. The HSI for 10 aquatic species (blue crab, brown shrimp, white shrimp, Gulf menhaden, spotted seatrout, largemouth bass, bay anchovy, Atlantic croaker, southern flounder, and eastern oyster) and 4 terrestrial species (green wing teal, mottled duck, America alligator, and gadwall) using model outputs under different diversion operations from Basin-wide Model Version 4, which is developed under the Mississippi River Hydro and Delta Management (MRHDM) and other related projects.

**Partnership of our Working Coast Phase II, Port Fourchon, Louisiana (2020-current)**. Role: tested and calibrated LAVegMod.PF and analyzed the model results. In order to evaluate the co-benefits of the placement of dredged material for created wetlands, including carbon capture in wetland soils and water quality improvements, an integrated model framework is being developed using the Delft3D-Flexible Mesh suite that takes into account the interaction among hydro-, morpho-, water quality, and vegetation dynamics. In particular, vegetation dynamics model is being developed in collaboration with Deltares to assess water quality and carbon sequestration in wetlands built with dredged material.

## SELECTED PUBLICATIONS

Liang JH., Liu J., Benfield. M., Justic D., Holstein. D., Liu B. 2021. Including the effects of subsurface

currents on buoyant particles in Lagrangian particle tracking models: Model development and its application to the study of riverborne plastics over the Louisiana/Texas shelf, *Ocean modeling*, 167, 101879, <https://doi.org/10.1016/j.ocemod.2021.101879>

Liu, B., D'Sa, E. J., Maiti, K., Rivera-Monroy, V. H., and Xue, Z. G. 2021. Biogeographical trends in phytoplankton community size structure using adaptive sentinel 3-OLCI chlorophyll a and spectral empirical orthogonal functions in the estuarine-shelf waters of the northern Gulf of Mexico, *Remote Sensing of Environment*, 252, 112-154, [doi.org/10.1016/j.rse.2020.112154](https://doi.org/10.1016/j.rse.2020.112154)

Clementson, L.A., Richardson, A. J., Rochester, W.A., Oubelkheir, K., Liu, B., D'Sa, E.J., Luiz, F., Ajani, A.P., Schroeder, T., Ford, P. W., Burford, M., Saeck, E., Andrew D.L. Steven, D.L. 2021. 100-year flood on a subtropical coastal phytoplankton community, *Frontiers in Marine Science* (accepted)

Liu, B., D'Sa, E. J., and Joshi, I. 2019. Multi-decadal trends and influences on dissolved organic carbon distribution in the Barataria Basin, Louisiana from in-situ and Landsat/MODIS observations, *Remote Sensing of Environment*, 228, 183-202, [doi:10.1016/j.rse.2019.04.023](https://doi.org/10.1016/j.rse.2019.04.023)

Liu, B., D'Sa, E. J., and Joshi, I. 2019. Floodwater impact on Galveston Bay phytoplankton taxonomy, pigment composition and photo-physiological state following Hurricane Harvey from field and ocean color (Sentinel-3A OLCI) observations, *Biogeosciences*, 16, 1975–2001, [doi:10.5194/bg-16-1975-2019](https://doi.org/10.5194/bg-16-1975-2019)

## SELECTED OTHER DOCUMENTS

Baustian, M.M., Liu, B., Moss, L., and Wang, Y. 2022. Estimating Changes of Net Greenhouse Gas Sinks and Sources in Louisiana's Coastal Area from Implementation of the State's 2017 Coastal Master Plan.

Liu B., Jung H., Kiskaddon E., and Carruthers T. 2021. Aquatic Habitat Suitability Index Calculations for Mid-Breton Sediment Diversion Environmental Impact Statement, The Water Institute of the Gulf. Prepared for Coastal Protection and Restoration Authority.

The Water Institute of the Gulf. 2020. RESTORE Act Center of Excellence for Louisiana. Tracking the Success Metrics of RESTORE Act Center of Excellence for Louisiana – RFP1 Cycle. Baton Rouge, LA.