Yanda Ou, Ph.D. Candidate
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RESEARCH INTERESTS

- Coastal and estuarine hydrodynamic and biogeochemical processes
- Applications of machine learning to coastal water quality studies
- Modeling coastal hydrodynamics and biogeochemistry

EDUCATION

Ph.D. expected in Dec 2022 **Oceanography and Coastal Sciences** Louisiana State University
Advisors: Dr. Z. George Xue

2017 M.S. **Physical Oceanography** Ocean University of China, China.
Advisor: Dr. Peiliang Li

2014 B.E. **Ocean Science** Ocean University of China, China.

RESEARCH EXPERIENCE

2018–2022 Research Assistant, Louisiana State University, Baton Rouge, LA, USA

- Modeled salinity environment in the Barataria Estuary, LA, USA using a 3-dimensional Regional Modeling System (ROMS) and assessed the impacts of man-made river diversion systems on the estuarine salinity environment
- Developed a 3-dimensional biogeochemical model and embedded it in the ROMS for bottom water hypoxia investigations in the Louisiana-Texa shelf
- Developed a daily prediction model for Louisiana-Texa shelf hypoxic area using machine learning approaches
- Developing an operational forecast system for hydrodynamics and biogeochemistry in the northern Gulf of Mexico (on-going, August 2022)

2014–2017 Research Assistant, Ocean University of China, Qingdao, China

- Simulated ocean surface wave environments in the Taiwan Strait using a third-generation wave model (Simulating WAve Nearshore, SWAN)
- Investigated sea-level changes along the Qingdao coastal area and performed data analysis and visualization
- Assisted the deployment and application of the submarine cable online observation system along the coastal waters in the Shandong Province

PROFESSIONAL SKILLS

Programming language and analytics software

- FORTRAN, Bash, and Perl
- MATLAB, R, and NCL
- Nine-year working experiences on high-performance computers (HPC) in Linux Environment

Numerical models

- Coupled-Ocean-Atmosphere-Wave-Sediment Transport Modeling System (COAWST) including model coupling among ROMS, SWAN (or WAVEWATCH III), WRF, COAWST-embedded sediment models, and COAWST-embedded biogeochemical models.
- Biogeochemical models (e.g., North Pacific Ecosystem Model for Understanding Regional Oceanography, NEMURO) embedded in the ROMS and in the COAWST
- Machine learning models (e.g., generalized linear models and generalized additive models)

Data Analysis

- Statistical analysis using R and MATLAB
- Time series analysis and forecast (e.g., periodogram analysis, ensemble empirical mode decomposition, and autoregression model), Spectral analysis (e.g., data filtering, Fourier transformation, and wavelet), spatial and temporal analysis (e.g., empirical orthogonal function and composite analysis) etc.
- Specific analysis for oceanography such as tidal harmonic analysis and tide prediction

PUBLICATIONS

Published

Ou, Y., Li, B., & Xue, Z. G. (2022). Hydrodynamic and biochemical impacts on the development of hypoxia in the Louisiana–Texas shelf– Part 2: statistical modeling and hypoxia prediction. Biogeosciences, 19, 3575–3593. https://doi.org/10.5194/bg-19-3575-2022

Ou, Y., Xue, Z. G., Li, C., Xu, K., White, J. R., Bentley, S. J., & Zang, Z. (2020). A numerical investigation of salinity variations in the Barataria Estuary, Louisiana in connection with the Mississippi River and restoration activities. Estuarine, Coastal and Shelf Science, 245, 107021. https://doi.org/10.1016/j.ecss.2020.107021

Ou, Y., Zhai, F., & Li, P. (2018). Interannual wave climate variability in the Taiwan Strait and its relationship to ENSO events. Journal of Oceanology and Limnology, 36(6), 2110–2129. https://doi.org/10.1007/s00343-019-7301-3

Liu, H., Xu, K., **Ou, Y.**, Bales, R., Zang, Z., & Xue, Z. G. (2020). Sediment transport near ship shoal for coastal restoration in the Louisiana shelf: A model estimate of the year 2017-2018. Water (Switzerland), 12(8), 2212. https://doi.org/10.3390/w12082212

Zang, Z., Xue, Z. G., Xu, K., Bentley, S. J., Chen, Q., D'Sa, E. J., Zhang, L., **Ou, Y.** (2020). The Role of Sediment-induced Light Attenuation on Primary Production during Hurricane Gustav (2008). Biogeosciences, 17, 5043–5055. https://doi.org/10.5194/bg-17-5043-2020

Anderson, M. M., Maiti, K., Xue, Z. G., & **Ou, Y.** (2020). Dissolved inorganic carbon transport in the surface-mixed layer of the Louisiana Shelf in northern Gulf of Mexico. Journal of Geophysical Research: Oceans, 125(11), e2020JC01660. https://doi.org/10.1029/2020JC016605

Under Revision

Ou, Y., & Xue, Z. G. (2022). Hydrodynamic and Biochemical Impacts on the Development of Hypoxia in the Louisiana--Texas Shelf Part I: Numerical Modeling and Hypoxia Mechanisms. Biogeosciences Discussions (pre-print), 2022, 1–43. https://doi.org/10.5194/bg-2022-3

PROFESSIONAL TRAINING

- The Unifying Innovations in Forecasting Capabilities workshop hosted by jointly by the Earth Prediction Innovation Center (EPIC), the Unified Forecast System (UFS), and the UFS Research to Operations community, July 18-22, 2022, Holiday Inn in College Park, MD

- The Coupled Ocean-Atmosphere-Wave-Sediment Transport (COAWST) numerical model workshop hosted jointly by the North Carolina State University (NCSU) and the United States Geological Survey (USGS), February 25-28, 2019, NCSU, Raleigh, NC
- The Louisiana State University (LSU) High-performance Computer (HPC) Training workshop hosted by the LSU, January 31-April 18, 2018, LSU, Baton Rouge, LA

SERVICES AND ACTIVITIES

Teaching Experience

- Introduction to Oceanography. Teaching assistant in an undergraduate-level class, Fall 2021, LSU campus.
- Introduction to Oceanography. Teaching assistant in an undergraduate-level class, Spring 2021, online class

Manuscript Review

- Phan, H. M., Ye, Q., Reniers, A. J. H. M., & Stive, M. J. F. (2019). Tidal wave propagation along The Mekong deltaic coast. Estuarine, Coastal and Shelf Science, 220(February), 73–98. https://doi.org/10.1016/j.ecss.2019.01.026

HONORS AND AWARDS

Ocean University of China Second Prize Scholarship, China, 2016-2017
Ocean University of China Second Prize Scholarship, China, 2015-2016
Ocean University of China Second Prize Scholarship, China, 2014-2015

PROFESSIONAL PRESENTATIONS

Conference Abstracts

Ou, Y. & Xue, Z. G. (2022). The Hydrodynamic and Biochemical Impacts on the Variability of Bottom Dissolved Oxygen Concentration in the Louisiana-Texas Shelf. The Ocean Carbon & Biogeochemistry workshop, June 20-23, 2022, Falmouth, MA. (Poster)

Ou, Y., Xue, Z. G., & Li, B. (2022). Gulf-COAWST Prediction of Hypoxic area in the Louisiana-Texas Shelf Using Combined Numerical Modeling and Machine Learning Methods. The Gulf of Mexico Conference, April 25-27, Baton Rouge, LA. (Oral)

Ou, Y., Xue, Z. G., & Li, B. (2022). Hydrodynamic and Biochemical Impacts on the Variability of Bottom Dissolved Oxygen Concentration in the Louisiana-Texas Shelf: From Mechanism to Prediction. Ocean Sciences Meeting, February 24-March 4, Virtual conference. (Oral)

Ou, Y. & Xue, Z. G. (2021). The Hydrodynamic and Biochemical Impacts on the Variability of Bottom Dissolved Oxygen Concentration in the Louisiana-Texas Shelf. The AGU Fall Meeting, December 13-17, New Orleans, LA. (Poster)

Ou, Y., Xue, Z. G., Li, C., Xu, K., White, J. R., Bentley, S. J., & Zang, Z. (2021). A Numerical Investigation of Salinity Variations in Barataria Estuary, Louisiana in Connection with the Mississippi River and Restoration Activities. State of the Coast Conference, June 2-4, Virtual conference. (Poster)

Ou, Y., Xue, Z. G., Li, C., Xu, K., White, J. R., Bentley, S. J., & Zang, Z. (2021). A Numerical Investigation of Salinity Variations in Barataria Estuary, Louisiana in Connection with the Mississippi River and Restoration Activities. The 13th International Symposium on Biogeochemistry of Wetlands, March 22-25, Virtual conference. (Oral)