Yiming Guo, Ph.D.

Illinois State University

Department of Geography, Geology, and the Environment

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EDUCATION

Ph.D. in Marine Science 2017-2022

North Carolina State University, Raleigh, NC, U.S.

Thesis: On the Ocean Divergent Eddy Heat Flux and its Variability in the Western Boundary Currents.

B.S. in Marine Science 2012-2016

Ocean University of China, Qingdao, China

Thesis: Spatiotemporal variations of the Kuroshio east of Taiwan derived from satellite altimetry.

RESEARCH INTERESTS

Ocean tracer transport and energy budget

Ocean mesoscale and submesoscale dynamics

Jet dynamics and air-sea interaction

Ocean carbon capture and storage

Regional ocean modeling and shelf dynamics

POSITIONS

Assistant Professor 2025.8-

Illinois State University, Normal, IL, U.S.

Guest Investigator 2025.8-

Woods Hole Oceanographic Institution, Woods Hole, MA, U.S.

Postdoctoral Investigator 2024.1-2025.8

Woods Hole Oceanographic Institution, Woods Hole, MA, U.S.

Postdoctoral Associate 2022.11-2023.12

Yale University, New Haven, CT, U.S.

Graduate Teaching & Research Assistant 2018-2022

North Carolina State University, Raleigh, NC, U.S.

Graduate Research Fellow 2020.8-2020.12

National Center for Atmospheric Research, Boulder, CO, U.S.

Visiting Student 2019.5

Graduate School of Oceanography, University of Rhode Island, RI, U.S.

Research Assistant 2016-2017

Shanghai Ocean University, Shanghai, China

Research Assistant 2016-2017

Institute of Oceanology, Chinese Academy of Sciences, Qingdao, China

Undergraduate Research Assistant 2014-2015

Ocean University of China, Qingdao, China

AWARDS

International Visiting Fellowships, Ocean Frontier Institute and Dalhousie University, Canada, June-July 2026

Awardee, XMAS 2025 Special Reception for Early Career Scientists, Xiamen, China, January 2025.

Winner of the Poster Presentation Competition, Yale Climate Day, Yale Institute for Biospheric Studies, New Haven, CT, U.S. May 2023.

Awardee, Physical Oceanography Dissertations Symposium (PODS) XII, Hawai'I, October 2022 (Invited participant, but declined due to schedule conflict).

NCAR Advanced Study Program Grad Fellowship, National Center for Atmospheric Research, Boulder, CO, U.S. August 2021-December 2021.

Early Career & Student Presentation Awards, International Workshop for Mid-latitude Air-sea Interaction, Sapporo, Japan. June 2021.

Provost's Doctoral Fellowship, North Carolina State University, Raleigh, NC, U.S. 2017-2018.

University Graduate Fellowship supplement, North Carolina State University, Raleigh, NC, U.S. 2017-2018.

Student of the Year Award, Laurel Industrial Company, Inc & Ocean University of China, Qingdao, China. 2014.

Scholarship for Excellent Academic Achievement, Ocean University of China, Qingdao, China. 2013, 2014, 2015.

PUBLICATIONS

Marx, L., Rheuban, J., **Guo, Y.**, Martin, E., McCorkle, D., Wang, Z., Michel, A., Chen, K., Kim, H., Subhas, A., 2025. Biological site selection criteria framework for offshore ocean alkalinity enhancement. *Submitted.*

Guo, Y., Chen, K., Subhas, A., Rheuban, J., Wang, Z., McCorkle, D., Michel, A., Kim, H., 2025. Site selection for ocean alkalinity enhancement informed by passive tracer simulations. *Nature Communications: Earth & Environment,* 6(1), 535*,* doi: s43247-025-02480-1

Subhas, A. V., Rheuban, J. E., Wang, Z. A., ... & **Guo, Y.**, Kim, H., Chen, K., 2025. A tracer study for the development of in-water monitoring, reporting, and verification (MRV) of ship-based ocean alkalinity enhancement. *EGUsphere*, 2025, 1-34.

Guo, Y. and Timmermans, M-L., 2025. Swirling currents: Can Ocean Swirls Help Fight Climate Change? *Frontiers for Young Minds,* doi: 10.3389/frym.2025.1471573.

Guo, Y. and Timmermans, M-L., 2024b. Global ocean pCO_2 variation regimes: spatial patterns and the emergence of a hybrid regime. *Journal of Geophysical Research: Oceans*, doi: 10.1029/2023JC020679.

Guo, Y. and Timmermans, M-L., 2024a. The role of ocean mesoscale variability in air-sea CO_2 exchange: a global perspective. *Geophysical Research Letters,* doi: 10.1029/2024GL108373. *[OCB Science Highlights: https://www.us-ocb.org/mesoscale-affects-airsea-co2/]*

Cherian, D., **Guo, Y.,** Bryan, F., 2024. Assessing modelled mesoscale stirring using microscale observations. *Journal of Physical Oceanography*, doi: 10.1175/JPO-D-23-0135.1.

Guo, Y., Bishop, S., Bryan, F., & Bachman, S., 2023. Mesoscale variability linked to interannual displacement of Gulf Stream. *Geophysical Research Letters*, doi: 10.1029/2022GL102549.

Yang, Y., **Guo, Y.,** Zeng, L., and Wang, Q., 2023. Eddy-induced Sea surface salinity changes in the South China Sea. *Frontiers in Marine Science,* doi: 10.3389/fmars.2023.1113752.

Guo, Y., Bachman, S., Bryan, F., and Bishop, S., 2022. Increasing Trends in Oceanic Surface Poleward Eddy Heat Flux Observed Over the Past Three Decades. *Geophysical Research Letters*, doi: 10.1029/2022GL099362.

Guo, Y., Bishop, S., Bryan, F. and Bachman, S., 2022. A global diagnosis of eddy potential energy budget in an eddy permitting ocean model. *Journal of Physical Oceanography,* doi: 10.1175/JPO-D-22-0029.1.

Guo, Y. and Bishop, S.P., 2022. Surface Divergent Eddy Heat Fluxes and Their Impacts on Mixed Layer Eddy-Mean Flow Interactions. *Journal of Advances in Modeling Earth Systems,* doi: 10.1029/2021MS002863.

Bishop, S. P., **Y. Guo**, F.O. Bryan, & R.J. Small. 2020. The global sink of available potential energy by mesoscale air-sea interaction. *CLIVAR Exchanges, 77 /US CLIVAR Variations, 18, 1; 13–16.*

PRESENTATIONS

Talk: "Site Selection for Ocean Alkalinity Enhancement on the US Northeast Shelf: Perspectives from Passive Tracer Experiments" WHOI Postdoc Symposium, MBL Swope Center, Woods Hole, MA, February 2025.

Poster: "Site Selection for Ocean Alkalinity Enhancement on the US Northeast Shelf: Perspectives from Passive Tracer Experiments" 2024 AGU Fall Meeting, D.C., December 2024.

Talk (invited): "The Role of Ocean Mesoscale Eddies in Climate" Department of Geography, Geology, and the Environment, Illinois State University, IL, December 2024.

Talk (invited): "The Role of Ocean Mesoscale Variability in Climate" Department of Marine Science, Coastal Carolina University, Conway, SC, October 2024.

Talk (invited): "Mesoscale tracer transport in the global ocean" 2024 SMAST DEOS fall seminar series, University of Massachusetts, Dartmouth, MA, September 2024.

Talk: "Swirling Currents: How Ocean Eddies Affect Carbon Dioxide Absorption and Fight Climate Change" 2024 Science Communication Workshop, Woods Hole, MA, August 2024.

Poster: "The role of ocean mesoscale variability in air-sea CO_2 exchange: Insights from a global 1/10° simulation." 2024 Ocean Carbon & Biogeochemistry (OCB) workshop, Woods Hole, MA, June 2024.

Talk: "Surface pCO_2 variation regimes in the global ocean and the role of mesoscale eddies." 2024 Ocean Sciences Meeting, New Orleans, LA, February 2024.

Talk: "Surface pCO_2 variation regimes in the global ocean" WHOI Postdoc Symposium, Woods Hole Oceanographic Institution, Woods Hole, MA, January 2024.

Talk (invited): "Mesoscale transport and the eddy potential energy budget" WHOI Physical Oceanography Seminar, Woods Hole Oceanographic Institution, MA, October 2023. (Postponed to March 19, 2024)

Talk: "Mesoscale eddies: the weather of the ocean" Yale EPS Postdoc Seminar, Yale University, New Haven, CT, October 2023.

Poster: "Ocean pCO2 variation regimes in the global surface ocean." 2023 Yale Climate Day, New Haven, CT, U.S. May 2023. [Recipient of poster prize awards]

Talk: "Mesoscale air-sea interaction and the eddy potential energy budget, is it important?" 2022 Ocean Sciences Meeting, virtual. March 2022.

Talk: "Global role of mesoscale air-sea interaction on eddy energetics in high-resolution ocean and climate models" iHESP annual meeting, Texas A&M university, College Station, Texas, January 2022. (meeting cancelled)

Talk: "Eddy heat flux and eddy potential energy budget" Oceanography seminar, NCAR, Boulder, October 2021.

Talk (invited): "Mesoscale air-sea interaction and the eddy potential energy budget, is it important?" ATOC Colloquium, University of Colorado, Boulder, September 2021.

Talk: "Mid-latitude mesoscale air-sea interaction and the eddy potential energy budget" International Workshop for Mid-latitude Air-sea Interaction, Sapporo, Japan. June 2021. [Recipient of the Early career & Student Presentation Awards]

Talk: "Mesoscale air-sea interaction and the eddy potential energy budget, is it important?" CESM Ocean Model Working Group Meeting, Boulder, CO, U.S. February 2021.

Poster: "Interannual variability of observed surface divergent meridional eddy heat fluxes in the Kuroshio Extension and Gulf Stream."
2020 Ocean Sciences Meeting, San Diego, CA, U.S. February 2020.

Talk: "Surface Divergent Meridional Eddy Heat Fluxes in the Gulf Stream."
The Middle Atlantic Bight Physical Oceanography and Meteorology (MABPOM) Meeting, Raleigh, NC, U.S. October 2019.

Talk: "Long-term Estimate of Meridional Eddy Heat Transport in the Ocean Mixed Layer."
MEAS Graduate Student Seminar, North Carolina State University, Raleigh, NC, U.S. March 2019.

Poster: "Long-term Estimate of Meridional Eddy Heat Transport in the Ocean Mixed Layer."
CLIVAR workshop "Sources and Sinks of Ocean Mesoscale Eddy Energy", Tallahassee, Fl, U.S. March 2019.

Proposals

NOAA Climate & Global Change proposal entitled "Gulf Stream in a Changing Climate"
Period: 2022-2024 Contribution: Idea Design and Writing; Role: PI; Status: unfunded.

NSF Physical Oceanography proposal entitled "The Efficiency of Baroclinic Instability in the Global Ocean"
Period: 2020-2023 Contribution: Idea Design and Writing Assistance; Role: Investigator; Status: funded

NASA ROSES proposal entitled "The Wavenumber-Frequency Cross-Spectrum of Eddy Heat Flux in the Western Boundary Current Extensions"
Period: 2019-2021 Contribution: Writing Assistance; Role: Investigator; Status: unfunded.

OUTREACH and ACTIVITIES

Seminar Organizer, Department of Physical Oceanography, Woods Hole Oceanographic Institution, Woods Hole, MA, U.S. June 2024-present

Judge for STEAM Fair Projects, Grade 9-12, Falmouth Public Schools, MA, U.S., February 26, 2025.

Volunteer for Woods Hole Science Stroll 2024, Woods Hole, MA, U.S., August 10, 2024.

Presenter at Science Communication Workshop 2024, Woods Hole, MA, U.S., August 2, 2024.

Volunteer for 7th Grade Day in the Village, NOAA Fisheries and Woods Hole Oceanographic Institution, Woods Hole, MA, U.S., May 23, 2024.

NCAR CESM Tutorial Workshop, National Center for Atmospheric Research, Boulder, CO, U.S. August 2019.

ENVS Summer School, Hong Kong University of Science and Technology, Hong Kong, China, July 2016.

Administrative Assistant in President's Office, Ocean University of China, Qingdao, China, 2015-2016.

National Undergraduate Training Programs for Innovation and Entrepreneurship, Ocean University of China, Qingdao, China, 2014-2016.

TEACHING and MENTORSHIP

Student Mentorship:

- 2020-2022 Chris Gao (Parsons School of Design Undergraduate) – Mentoring for GRE preparation and graduate school application

Teaching Assistant, Labs for Earth System Sciences, North Carolina State University, Raleigh, NC, U.S. 2018 Fall, 2019 Spring, 2019 Fall, 2020 Spring.

Lecturer, SAT math & AP Calculus, Qingdao SAT Center, Qingdao, China, 2017.

Tutor, Qingzhou Summer School for Math and English, Qingzhou, China, 2012-2013

FIELDWORK

LOCNESS Field Trial Phase-02, R/V Connecticut, South of Martha's Vineard, USA, Woods Hole Oceanographic Institution, September 2024 (Postponed).

Jiaozhou Bay, Qingdao, China, R/V Yuanjian I, Coastal Observation Training, Ocean University of China, September 2015.

Jiaozhou Bay, Qingdao, China, R/V Tianshi I, Marine Investigation Training, Ocean University of China, May 2014.

PROFESSIONAL AFFILIATIONS

Reviewer for *Nature Communications, Journal of Physical Oceanography, Journal of Climate, Geophysical Research Letters, Earth's Future, Progress in Oceanography, Journal of Advances in Modeling Earth Systems, Climate Dynamics, Ocean Dynamics, Frontier in Marine Sciences, Advances in Atmospheric Sciences.*

Member, American Geophysical Union.