Huaiyu Wei

Los Angeles, CA | hywei@atmos.ucla.edu | (310) 696-3887

My website | Google Scholar | ResearchGate | GitHub

Employment

University of California, Los Angeles (UCLA) Feb. 2024 – Present
Postdoctoral Researcher, Advisor: Prof. Andrew Stewart

Education

The Hong Kong University of Science and Technology (HKUST) Aug. 2019 – Feb. 2024
Ph.D. in Marine Environmental Science, Advisor: Prof. Yan Wang
Thesis: Parameterizing Mesoscale Eddy Fluxes across Continental Slopes

Sun Yat-sen University (SYSU) Sep. 2015 – July 2019
B.S. in Physical Oceanography, Advisor: Prof. Zhan Hu
Thesis: Laboratory study on Wave dissipation by vegetation in combined current wave flow

Boston University May 2023 – Aug. 2023
Visiting student, Advisor: Prof. Xiaozhou Ruan

University of British Columbia July 2017 – Aug. 2017
Vancouver Summer Program, Best presentation award

Research Interests

Geophysical fluid dynamics; Eddy dynamics over sloping seafloor; Eddy parameterization; Meridional overturning circulation; Machine learning

Publications

Wei, H., Stewart, McWilliams, J., A., Capó, E. Formation of Abyssal Downwelling-Favorable Prograde Flows via Mesoscale Eddy Potential Vorticity Mixing: Dependence on Environmental Parameters. In preparation (Preprint available upon request).

Wei, H., Srinivasan, K., Stewart, A., Solodoch, A., Manucharyan, G., Hogg, A. Full-depth reconstruction of long-term Meridional Overturning Circulation variability from satellite-measurable quantities via machine learning. Submitted.

1. Li, D., **Wei, H.**, & Ruan, X. (2025). The importance of eddy stirring in wind-driven coastal upwelling. *Journal of Physical Oceanography*, 55(1), 29-42.
2. **Wei, H.**, Wang, Y., & Mak, J. (2024). Parameterizing eddy buoyancy fluxes across prograde shelf/slope fronts using a slope-aware GEOMETRIC closure. *Journal of Physical Oceanography*, 54(2), 359-377.
3. Xie, C.*, **Wei, H.***, & Wang, Y. (2023). Bathymetry-aware mesoscale eddy parameterizations across upwelling slope fronts: A machine learning-augmented approach. *Journal of Physical Oceanography*, 53(12), 2861-2891. (*Contributed equally)
4. Xie, C., **Wei, H.**, & Wang, Y. (2023). Impact of parameterized isopycnal diffusivity on shelf-ocean exchanges under upwelling-favorable winds: offline tracer simulations augmented by artificial neural network. *Journal of Advances in Modeling Earth Systems*, 15(4), e2022MS003424.
5. **Wei, H.**, Wang, Y., Stewart, A. L., & Mak, J. (2022). Scalings for eddy buoyancy fluxes across prograde shelf/slope fronts. *Journal of Advances in Modeling Earth Systems*, 14(12), e2022MS003229. (Issue cover)
6. Hu, Z., Lian, S., Zitman, T., Wang, H., He, Z., **Wei, H.**, et al. (2022). Wave breaking induced by opposing currents in submerged vegetation canopies. *Water Resources Research*, 58(4), e2021WR031121.
7. **Wei, H.**, & Wang, Y. (2021). Full-depth scalings for isopycnal eddy mixing across continental slopes under upwelling-favorable winds. *Journal of Advances in Modeling Earth Systems*, 13(6), e2021MS002498. (Issue cover)

8. Hu, Z., Lian, S., **Wei, H.**, Li, Y., Stive, M., & Suzuki, T. (2021). Laboratory data on wave propagation through vegetation with following and opposing currents. *Earth System Science Data*, 13(10), 4987-4999.

RESEARCH SUPPORT & FELLOWSHIP

"Reconciling diapycnal upwelling versus eddy-driven downwelling in the ocean's sloping bottom boundary layers" NSF proposal (submitted).

"Leveraging Machine Learning and Satellite Measurements to Predict Ocean Meridional Overturning Circulation" Explore ACCESS project. 2024-2026

Postgraduate Studentship, HKUST 2019-2024

Conference Experience

AGU 2024, Washington, D.C., US Dec. 2024
Oral presentation: "Reconstructing Meridional Overturning Circulation from Satellite Measurements via Neural Networks"

Ocean Science Meeting 2024, New Orleans, US Feb. 2024
eLightning presentation: "Parameterizing eddy buoyancy fluxes across prograde shelf/slope fronts using a slope-aware GEOMETRIC closure"

Ocean Transport and Eddy Energy Meeting 2023, WHOI, US May 2023
Oral presentation: "Parameterization for Eddy Buoyancy Fluxes Across Prograde Shelf/Slope Fronts"

Ocean Science Meeting 2022, Online Mar. 2022
Oral presentation: "Full-Depth Scalings for Isopycnal Eddy Mixing Across Continental Slopes Under Upwelling-Favorable Winds"

EGU 2018, Vienna, Austria Apr. 2018
Poster presentation: "The pattern and control of erodibility of cohesive sediments in a *Spartina alterniflora* marsh on the coast of Jiangsu, China"

Invited Talks

1. 'Reconstructing Meridional Overturning Circulation from Satellite Measurements via Neural Networks', Boston University (20^{th} Dec. 2024), MIT (3^{rd} Jan. 2025), UCLA AOS department Seminar (19^{th} Feb. 2025), and SNAP seminar (24^{th} Feb. 2025).
2. 'Parameterizing Eddy Mixing across Continental Slopes under Upwelling-Favorable Winds', Marine Center Spring Meeting, UCLA, 9^{th} May 2024.
3. 'Parameterizing Isopycnal Eddy Mixing across Continental Slopes', AOS Ocean Seminar, UCLA, 9^{th} Apr. 2024.

Selected Awards

RedBird Academic Excellence Award, HKUST 2023

Best Presentation Award, HKUST Postgraduate Seminar 2023

Outstanding Graduate, SYSU 2019

National Scholarship, China (Top 1%) 2018

The Giordano Scholarship, SYSU (Top 2%) 2017

The Coca-Cola Scholarship for Outstanding Students, SYSU (Top 5%) 2016

Teaching Experience

Guest lecturer in graduate Geophysical Fluid Dynamics at UCLA - Tides 2025

Guest lecturer in undergraduate Physical Oceanography at UCLA - Tides 2024

Teaching assistant in "Survey of Ocean Science" 2022

Teaching assistant in "Descriptive Physical Oceanography" 2021

Teaching assistant in "The Earth as a Blue Planet" 2020

Teaching assistant in "General Chemistry & Hydromechanics" 2018

Additional Information

Journal reviewer: Nature Communication, Journal of Advances in Modeling Earth Systems, Journal of Physical Oceanography, Geophysical Research Letters, Ocean Modelling.

Language Skills: Mandarin (Native), English (IELTS score: 7.5).

Computer programming: Fortran, MATLAB, Python.