

Huaiyu Wei

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My website | Google Scholar | ResearchGate | GitHub

Employment

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

The Hong Kong University of Science and Technology (HKUST) Ph.D. in Marine Environmental Science, Advisor: Yan Wang Thesis: Parameterizing Mesoscale Eddy Fluxes across Continental Slopes	Aug. 2019 – Feb. 2024
Sun Yat-sen University (SYSU) B.S. in Physical Oceanography, Advisor: Zhan Hu Thesis: Laboratory study on Wave dissipation by vegetation in combined current wave flow	Sep. 2015 – July 2019
Boston University Visiting student, Advisor: Prof. Xiaozhou Ruan	May 2023 – Aug. 2023
University of British Columbia Summer Program	July 2017 – Aug. 2017

Research Interests

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

Publications

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- Wei, H.**, Stewart, A. L., McWilliams, J. C., 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. L., Solodoch, A., Manucharyan, G., Hogg, A. Full-depth reconstruction of long-term Meridional Overturning Circulation variability from satellite-measurable quantities via machine learning. Submitted. Preprint available on ESS OPEN ARCHIVE.
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, PI: Huaiyu Wei, Co-PIs: Andrew Stewart, Jim McWilliams, Henri Drake (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 (20th Dec. 2024), MIT (3rd Jan. 2025), UCLA AOS department Seminar (19th Feb. 2025), and SNAP seminar (24th Feb. 2025).
2. “Parameterizing Eddy Mixing across Continental Slopes under Upwelling-Favorable Winds”, Marine Center Spring Meeting, UCLA, 9th May 2024.
3. “Parameterizing Isopycnal Eddy Mixing across Continental Slopes”, AOS Ocean Seminar, UCLA, 9th 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 GFD at UCLA - Baroclinic instability 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

Year of birth: 1997.

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

Computer programming: Fortran, MATLAB, Python.

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