

Huaiyu Wei

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[My website](#) | [Google Scholar](#) | [ResearchGate](#) | [GitHub](#)

Employment

University of California, Los Angeles (UCLA)

Feb. 2024 – Present

Postdoctoral Researcher

Advisor: Andrew L. Stewart & Jim McWilliams (since Nov. 2025)

Education

The Hong Kong University of Science and Technology (HKUST)

Aug. 2019 – Feb. 2024

Ph.D. in Marine Environmental Science, Advisor: 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: Zhan Hu

Thesis: Laboratory study on wave dissipation by vegetation in combined current wave flow

Boston University

May 2023 – Aug. 2023

Visiting student, Advisor: Xiaozhou Ruan

University of British Columbia

July 2017 – Aug. 2017

Summer Program on Ocean and Atmosphere Systems

Research Interests

Geophysical fluid dynamics (GFD); Eddy parameterization; Eddy-topography interaction; Meridional overturning circulation; Bottom boundary layer mixing; Machine learning

Publications

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. *Under review*. (Preprint available upon request).

Wei, H., Stewart, A. L., Medvedev A., Srinivasan, K., Solodoch, A., Manucharyan, G., & Hogg, A. Ocean overturning circulation can be observed from space using machine learning. *In preparation*. (Preprint available upon request).

1. **Wei, H.**, Srinivasan, K., Stewart, A. L., Solodoch, A., Manucharyan, G., & Hogg, A. (2025). Full-depth reconstruction of long-term Meridional Overturning Circulation variability from satellite-measurable quantities via machine learning. *Journal of Advances in Modeling Earth Systems*. 17(7), e2024MS004915. doi.org/10.1029/2024MS004915.
2. 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. doi.org/10.1175/JPO-D-24-0066.1.
3. **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. doi.org/10.1175/JPO-D-23-0152.1.
4. 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. doi.org/10.1175/JPO-D-23-0017.1. (*Contributed equally)
5. 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. doi.org/10.1029/2022MS003424.
6. **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.

- doi.org/10.1029/2022MS003229. (Issue cover)
7. 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.
doi.org/10.1029/2021WR031121
 8. 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.
doi.org/10.1029/2021MS002498. (Issue cover)
 9. 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.
doi.org/10.5194/essd-13-4987-2021.

Talks

1. "Formation of Abyssal Prograde Flows via Eddy Potential Vorticity Mixing", UC Irvine, 29th July 2025.
2. "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).
3. "Parameterizing Eddy Mixing across Continental Slopes under Upwelling-Favorable Winds", Marine Center Spring Meeting, UCLA, 9th May 2024.
4. "Parameterizing Isopycnal Eddy Mixing across Continental Slopes", AOS Ocean Seminar, UCLA, 9th Apr. 2024.

Conference Presentations & workshops

NCAR Regional Ocean Modeling Workshop, Boulder, US Regional ocean modeling with MOM6 in the Community Earth System Model framework	Oct. 2025
California GFD Meeting 2025, UCSB, US Organizing Committee & Oral presentation: "Eddy Potential Vorticity Mixing Drives Abyssal Prograde along-isobath Circulation"	Sept. 2025
Climate Process Team Meeting 2025, NYU/online, US Oral presentation: "Formation of Abyssal Prograde Flows via Mesoscale Eddy Potential Vorticity Mixing"	Aug. 2025
AGU 2024, Washington, D.C., US Oral presentation: "Reconstructing Meridional Overturning Circulation from Satellite Measurements via Neural Networks"	Dec. 2024
Ocean Science Meeting 2024, New Orleans, US eLightning presentation: "Parameterizing Eddy Buoyancy Fluxes across Prograde Shelf/Slope Fronts using a Slope-Aware GEOMETRIC Closure"	Feb. 2024
Ocean Transport and Eddy Energy Meeting 2023, WHOI, US Oral presentation: "Parameterization for Eddy Buoyancy Fluxes Across Prograde Shelf/Slope Fronts"	May 2023
Ocean Science Meeting 2022, Online Oral presentation: "Full-Depth Scalings for Isopycnal Eddy Mixing Across Continental Slopes Under Upwelling-Favorable Winds"	Mar. 2022
EGU 2018, Vienna, Austria Poster presentation: "The Pattern and Control of Erodibility of Cohesive Sediments in a <i>Spartina alterniflora</i> Marsh on the Coast of Jiangsu, China"	Apr. 2018

Research Support & Fellowship

"Leveraging Machine Learning and Satellite Measurements to Predict Ocean Meridional Overturning Circulation" NSF ACCESS Explore project (EES240055).	2024-2026
Postgraduate Studentship, HKUST	2019-2024

Selected Awards

Chancellor's Award for Postdoctoral Research nominee, UCLA	2025
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 - Density	2025
Guest lecturer in undergraduate Physical Oceanography at UCLA - Tides	2024
Teaching assistant at HKUST	2020-2022

Additional Information

Year of birth: 1997.

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

Computer programming: Fortran, MATLAB, Python.

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