

# Lilian (Lily) Dove

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## Education

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<b>California Institute of Technology</b>	Pasadena, CA
Ph.D. in Environmental Science and Engineering	2023
Thesis title: <i>Impacts of Zonal Asymmetry on Southern Ocean Dynamics and Biogeochemistry</i>	
<b>California Institute of Technology</b>	Pasadena, CA
M.S. in Environmental Science and Engineering	2021
<b>Massachusetts Institute of Technology</b>	Cambridge, MA
B.S. in Earth, Atmospheric and Planetary Science	2018

## Professional Appointments

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<b>Assistant Professor in Earth &amp; Atmospheric Sciences</b>	Atlanta, GA
Georgia Institute of Technology	2025 - present
<b>NOAA Climate &amp; Global Change Postdoctoral Fellow</b>	Providence, RI
hosted by Mara Freilich (Brown University)	2023 - 2025

## Honors and Awards

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- NOAA Climate & Global Change Postdoctoral Fellowship (2023-2025)
- Caltech Linde Center Community Building Award (2023)
- Caltech Certificate of Practice in Effective Teaching (2023)
- Richard H. Jahns Teaching Award (2022)
- Caltech Inclusion, Diversity, Equity, and Accessibility (IDEA) Advocate Award (2022)
- NSF Graduate Research Fellowship (2019-2022)
- American Meteorological Society First-Year Graduate Fellowship (2018)
- MIT Department of Earth, Atmospheric, and Planetary Science Excellence Award (2017)

## Publications

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\* denotes student advisees

- \*Gonzalez, M.E., **Dove, L.A.**, Freilich, M.A. (2025). Distribution and Transport of Antarctic Winter Water Biogeochemical Properties. *Geophysical Research Letters*.
- **Dove, L.A.** (2025). Observing Transient Ocean Currents from Space with Radar Interferometry. *Nature Reviews Earth & Environment*.
- Thompson, A.F., **Dove, L.A.**, \*Flint, E., Lacour, L., Boyd, P.W. (2024). Interactions between Multiple Physical Particle Injection Pumps in the Southern Ocean. *Global Biogeochemical Cycles*, 38.
- Wilson, E.A., **Dove, L.A.**, Gray, A.R., MacGilchrist, G., Purkey, S., Thompson, A.F., Youngs, M.K., Diggs, S., Balwada, D., Campbell, E.C., Talley, L.D. (2024). Future Priorities for Observing the Dynamics of the Southern Ocean. *Bulletin of the American Meteorological Society*.
- **Dove, L.A.**, Singer, C.E., Murphy, S.E. (2024). Bringing a Lens of Equity to Geoscience Qualifying Examinations. *AGU Advances*, 5.

- Balwada, D., Gray, A.R., **Dove, L.A.**, Thompson, A.F. (2024). Tracer Ventilation, Stirring, and Variability in the Antarctic Circumpolar Current near the Southwest Indian Ridge. *Journal of Geophysical Research: Oceans*, 129, 1.
- Erickson, Z.K., Fields, E., Johnson, L., Thompson, A.F., **Dove, L.A.**, D'Asaro, E.A., Siegel, D.A. (2023). Eddy Tracking from *in situ* and Satellite Observations. *Journal of Geophysical Research: Oceans*, 128, 8.
- Swart, S., du Plessis, M.D., Nicholson, S-A., **Dove, L.A.**, Thomalla, S., Thompson, A.F., Biddle, L., Edholm, J.M., Giddy, I., Heywood, K.J., Lee, C., Mahadevan, A., Monteiro, P.M.S., Shilling, G., de Souza, R.B. (2023). The Southern Ocean Mixed Layer and its Boundary Fluxes: Fine-scale Observational Progress and Future Research Priorities. *Philosophical Transactions of the Royal Society A*, 381, 2249.
- **Dove, L.A.**, Viglione, G.A., Thompson, A.F., Flexas, M.M., \*Cason, T.R., Sprintall, J. (2023). Controls on Wintertime Ventilation in Southern Drake Passage. *Geophysical Research Letters*, 50, 5.
- **Dove, L.A.**, Balwada, D., Thompson, A.F., Gray, A.R. (2022). Enhanced Ventilation in Energetic Regions of the Antarctic Circumpolar Current, *Geophysical Research Letters*, 49, 13.
- **Dove, L.A.**, Thompson, A.F., Balwada, D., Gray, A.R. (2021). Observational Evidence of Ventilation Hotspots in the Southern Ocean, *Journal of Geophysical Research: Oceans*, 126, 7.
- Wolf, M.J., Goodell, M., Dong, E., **Dove, L.A.**, Zhang, C., Franco, L.J., Shen, C., Rutkowski, E.G., Narducci, D.N., Mullen, S., Babbitt, A.R., and Cziczo, D.J. (2020). A Link between the Ice Nucleation Activity of Sea Spray Aerosol and the Biogeochemistry of Seawater, *Atmospheric Chemistry and Physics* 20, 23, 15341-15356.
- Wolf, M.J., Coe, A., **Dove, L.A.**, Zawadowicz, M.A., Dooley, K., Biller, S.J., Zhang, Y., Chisholm, S.W., Cziczo, D.J. (2019). Investigating the Heterogeneous Ice Nucleation of Sea Spray Aerosols Using *Prochlorococcus* as a Model Source of Marine Organic Matter. *Environmental Science and Technology* 53, 3, 1139-1149.

## Submitted Publications

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- Song, S., Lavin, P.D., Gray, A.R., Nachod, Z., Balwada, D., **Dove, L.A.**, Thompson, A.F. (in revision at *Artificial Intelligence for the Earth Systems*). Random Forest Regression on Multi-platform, *in-situ* Ocean Observations: Investigating High-frequency Nutrient Dynamics in the Southern Ocean.
- **Dove, L.A.**, Freilich, M.A., Siegelman, L., Fox-Kemper, B., Hall, P. (in revision at *Journal of Physical Oceanography*). Pycnocline Stratification Shapes Submesoscale Vertical Tracer Transport.
- Freilich, M.A. & **Dove, L.A.** (in revision at *Communications Earth & Environment*). Perspective: Physical Drivers of Heterogeneous Mesopelagic Biogeochemistry.

## Publications in Preparation (submission within 2 months)

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- Thompson, A.F., **Dove, L.A.**, Tranchant, Y-T., Klein, P., Peña-Molino, B., Herraiz-Borreguero, L., Legresy, B., Carli, E., Siegelman, L. (in preparation for submission to *Nature Communications*). The Dynamics of Southern Ocean Deep Subduction Events from Coincident SWOT and Glider Observations.
- Lacour, L., Briggs, N., Petiteau, L., Bressac, M., Guidi, L., Fernandez Castro, B., Thompson, A.F., **Dove, L.A.**, Picheral, M., Catalano, C., Schmechtig, C., Leymarie, E., Poteau, A., Claustre, H., Boyd, P.W. (in preparation for submission to *Proceedings of the National Academy of Sciences*). Particle Size Sets Carbon Penetration Depth in the Subantarctic Ocean.
- **Dove, L.A.**, Wood, M., Pickart, R. S., et al. (in preparation for submission to *Journal of Geophysical Research: Oceans*). Anomalously Fresh Autumn in the Chukchi Sea Driven by Sea Ice and Storms.

## Presentations

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\* denotes invited talks

- US CLIVAR Summit, Boulder, CO. July 2025. \*
- WHOI Physical Oceanography Seminar, Falmouth, MA. May 2025. \*
- EGU General Assembly, virtual. April 2025.
- UMass Amherst Environmental Engineering Seminar, Amherst, MA. February 2025. \*
- AGU Annual Fall Meeting, Washington DC. December 2024. \*
- NASA JPL Ocean & Cryosphere Seminar, Pasadena, CA. October 2024. \*
- Rutgers University Marine & Coastal Science Seminar, New Brunswick, NJ. October 2024. \*
- Georgia Tech Earth & Atmospheric Sciences Seminar, Atlanta, GA. September 2024. \*
- Ocean Transport and Eddy Energy Climate Process Team, Providence, RI. August 2024.
- Ocean Mixing Gordon Research Seminar, South Hadley, MA. June 2024.
- Stanford University Atmosphere & Ocean Science Seminar, Palo Alto, CA. April 2024. \*
- University of Rhode Island Physical Oceanography Seminar, Narragansett, RI. April 2024. \*
- Boston College Earth & Environmental Science Seminar, Boston, MA. March 2024. \*
- Ocean Sciences Meeting, New Orleans, LA. February 2024.
- Boston University Earth & Environment Seminar, Boston, MA. December 2023. \*
- Brown University Climate & Environment Seminar, Providence, RI. October 2023.
- Southern Ocean Observing System Symposium, Hobart, Australia. August 2023.
- GO-BGC Webinar, virtual. \* February 2023.
- University of Washington Physical Oceanography Seminar, Seattle, WA. October 2022. \*
- FilaChange Workshop, Providence, RI. August 2022.
- SOCCOM Annual Meeting, virtual. June 2022.
- Ocean Sciences Meeting, virtual. March 2022.
- Caltech Environmental Science & Engineering Seminar, Pasadena, CA. December 2021.
- Graduate Climate Conference, virtual. October 2020.
- SOCCOM Annual Meeting, virtual. June 2020.
- Ocean Sciences Meeting, San Diego, CA. February 2020.
- MIT EAPS Student Achievement Seminar, Cambridge, MA. May 2018.
- Technion Environmental Engineering Seminar, Haifa, Israel. August 2017.
- MIT Environmental Engineering Seminar, Cambridge, MA. May 2017.

## Media and Work for a General Audience

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- Tagging seals with sensors helps scientists track ocean currents and climate change (2024). Article in *The Conversation*. Interviewed on KCBS Radio (San Francisco) and CKNW Radio (Vancouver).
- Here's what makes the Drake Passage one of the deadliest places on Earth (2024). Quoted in *National Geographic*.
- Exploring Our Blue Planet with Underwater Robots (2023). *Caltech Science Journey* on YouTube.
- In the turbulent Drake Passage, scientists find a rare window where carbon sinks quickly into the deep ocean (2023). Article in *The Conversation*.
- How Oceanographers Explore our Blue Planet (2020). *Explore Caltech* on YouTube.

## Academic Service

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- **Peer Reviewer** for Science Advances, Nature Communications, AGU Advances, Journal of Physical Oceanography, Geophysical Research Letters, Journal of Geophysical Research: Oceans, Frontiers in Marine Science, Progress in Oceanography, Earth System Science Data
- **Session Organizer** of Gordon Research Seminar on Polar Marine Science, AGU Ocean Sciences, Future of Southern Ocean Dynamics meeting
- **Moderator** of the Transitioning into, out of, and around Climate Research panel (2025) and Supporting Early Career Researchers in Polar Oceanography town hall (2023)
- **Steering Committee Member** of Mentoring Women in Physical Oceanography to Increase Retention (MPOWIR; 2024-2027)
- **Panel Member** of US CLIVAR Phenomena, Observations, and Synthesis Panel (2025-2029)

## Teaching

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<b>Introduction to Atmospheric Dynamics (EEPS 1510)</b> Instructor of Modules 1 and 2, Brown University	Spring 2024
<b>Caltech Teaching Conference</b> Facilitator for the Workshop on Effective Teaching	September 2021 & 2022
<b>Earth's Climate (ESE 1)</b> Teaching Assistant and Guest Lecturer, Caltech	Spring 2022
<b>Earth's Oceans (ESE 102)</b> Teaching Assistant, Caltech	Fall 2019 & 2020

## Mentoring

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<b>Maggie Gonzalez</b> Student at Loyola University Chicago	Summer 2024
<b>Ayushman Choudhury</b> Now a Ph.D. student at University of Chicago	Spring 2024 - Spring 2025
<b>Taylor Cason</b> Now a Ph.D. student at University of Colorado Boulder	Summer 2022
<b>Ellie Flint</b> Now a Senior Project Engineer at Swinerton Builders	Summer 2021

## Research Cruises

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<b>NSF/UNOLS Polar Chief Scientist Training Cruise</b> USCGC <i>Healy</i> , 12 days. Chief scientist education, shoreside logistics, and CTD operations in the Chukchi Sea.	October 2024
<b>GO-SHIP P02</b> RV <i>Roger Revelle</i> , 34 days. LADCP operations and outreach coordination along a North Pacific decadal hydrographic survey line.	June-July 2022
<b>NBP 20-02: Thwaites Glacier</b> RVIB <i>Nathaniel B. Palmer</i> , 60 days. Seaglider and BGC-Argo deployment and hydrographic survey in the Bellingshausen and Amundsen Seas.	January-March 2020
<b>Introduction to Field Oceanography</b> SSV <i>Corwith Cramer</i> , 5 days. Study of the production and dispersion of sea spray aerosol at air-sea interface in the Florida Straits.	March 2018

## Outreach

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- Letters to a Pre-Scientist September 2023-present
- Creative Tuition Collective & British Antarctic Survey career speaker June 2023
- *Project Scientist* STEM Superstar (2x yearly) April 2021-present
- Pasadena Unified School District science night presenter (6x yearly) September 2020-June 2023
- *Adopt-a-Float* SOCCOM representative September 2019-September 2021
- Los Angeles County Science Fair judge April 2019 & 2022