

Anthony Meza

Ph.D. Candidate

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Education

Massachusetts Institute of Technology & Woods Hole Oceanographic Institution

Ph.D. in Physical Oceanography

Cambridge, MA

2021–Present

- Advisor: Geoffrey Gebbie

- Thesis Committee: Henri Drake, Christopher Piecuch, Viviane de Menezes, Raffaele Ferrari

University of California, Irvine

B.S. in Mathematics, Concentration in Data Science

Irvine, CA

2018–2021

Publications

- Meza, A., & Gebbie, G. (2025). Wind-driven mid-depth Pacific cooling in a dynamically consistent ocean state estimate. *Journal of Geophysical Research: Oceans*. doi.org/10.1029/2025JC022462

Research Experience

Woods Hole Oceanographic Institution

Graduate Research Assistant

Sep 2021–Present

Woods Hole, MA

- Tested causes of deep ocean cooling using global MITgcm simulations, supporting NASA efforts of global ocean modeling and data assimilation.
- Analyzed 40TB+ of high-resolution coupled climate model output to understand the connections between ocean circulation and dissolved chemicals in the ocean.
- Produced written reports, posters, and presentations to communicate findings to broader communities.
- Processed and analyzed 5TB+ of high-resolution ocean reanalysis data and found significant connections between near-shore sea surface temperature and extreme California precipitation events.
- Developed tools to analyze big climate data using Python and Julia.

Los Alamos National Laboratory

Summer Intern

Jun 2021–Aug 2021

Los Alamos, NM

- Implemented reduced-precision capabilities within the ocean component of the Energy Exascale Earth System Model.
- Found that reduced precision significantly reduced compute time but at cost of model skill.

Institute for Pure and Applied Mathematics

Summer Intern

Jun 2020–Sep 2020

Los Angeles, CA

- Designed and implemented reinforcement learning algorithms for adaptive packet routing in satellite network simulations.
- Empirical models were built in Python primarily using PyTorch and NetworkX.

Teaching Experience

- Co-organizer and Instructor
High Performance Computing and Data Analysis Workshop 2024
- Calculus Instructor
MIT-WHOI Joint Program Summer Math Refresher 2024
- Partial Differential Equations Instructor
MIT-WHOI Joint Program Summer Math Refresher 2023

Service & Leadership

- Committee Member *AMS Committee on Climate Variability and Change* 2024–Present
- Graduate Application Mentor *Joint Program Applicant Support & Knowledgebase* 2023–Present
- Physical Oceanography Representative *WHOI Joint Program Student Representative* 2023–2024
- Conference Co-Organizer *2023 Graduate Climate Conference* 2023
- At-Large Representative *WHOI Joint Program Student Representative* 2022–2023
- Conference Co-Organizer *2022 First Generation Summit* 2022
- Committee Member *UC Irvine Mathematics Inclusive Excellence Committee* 2020–2021

Workshops and Summer Schools Attended

- CESM/MOM6 Regional Modeling Workshop *NCAR Mesa Laboratory, Boulder, CO* May 2025
- ECCO Summer School *Asilomar Conference Center, Monterey, CA* May 2025
- Tracer Mixing in Fluids Across Planetary Scales Summer School *Brin Mathematics Research Center, College Park, MD* Jul 2024

Awards and Honors Received

- GEM Fellowship *National Consortium of Graduate Degrees for Minorities in Engineers, MIT* 2021
- Rose Hills Scholarship *Rose Hills Foundation, UC Irvine* 2020
- Rose Hills Scholarship *Rose Hills Foundation, UC Irvine* 2019
- Bellettini Scholarship *Maria Rebecca and Maureen Bellettini Fund, UC Irvine* 2019
- SCE STEM Scholarship *Southern California Edison, UC Irvine* 2019

Presentations

- **A. Meza**, G. Gebbie. "Wind-driven mid-depth Pacific cooling in a dynamically consistent ocean state estimate" ECCO Summer School, 19–30 May 2025, Asilomar Conference Center, Monterey, CA. *Poster*.
- **A. Meza**, P. Bhuyan, Z. Zheng, G. Gebbie., M. Linz, J. Wenegrat. "Surface to Bottom Connections in Earth's Ocean" Tracer Mixing in Fluids Across Planetary Scales Summer School, 8–19 Jul 2024, Brin Mathematics Research Center, College Park, MD. *Talk*.
- **A. Meza**, H. Seo. "Associations Between Coastally Trapped Waves and Wintertime Precipitation in California" Ocean Sciences Meeting, 18–23 Feb 2024, New Orleans, LA. *Poster*.
- **A. Meza**, H. Seo. "Associations Between Coastally Trapped Waves and Wintertime Precipitation in California" Graduate Climate Conference, 1–3 Nov 2023, Marine Biological Laboratory, Woods Hole, MA. *Poster*.
- **A. Meza**, G. Gebbie. "Drivers of subsurface Pacific cooling in ECCOv4r4" ECCO Annual Meeting 2023, 25 Jan 2023, University of Washington, Seattle, WA. *Virtual Talk*.

- **A. Meza**, G. Gebbie. "Drivers of mid-depth Pacific cooling trends in an ocean reanalysis" AGU Fall Meeting 2022, 2–4 Nov 2023, Chicago, IL. *Poster*.
- **A. Meza**, G. Gebbie. "Drivers of mid-depth Pacific cooling trends in an ocean reanalysis" Graduate Climate Conference, 31 Oct 2022, University of Washington, Seattle, WA. *Poster*.
- C. Tran, **A. Meza**, H.L. Tung, H. Liu. "A Reinforcement Learning Approach to Packet Routing on a Dynamic Network" Joint Mathematics Meeting, 6–9 Jan 2021, Virtual. *Virtual Talk*.

Professional References

Geoffrey Gebbie (ggebbie@whoi.edu)

Henri Drake (hdrake@uci.edu)

Christopher Piecuch (cpiecuch@whoi.edu)