

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

Expected 2026

University of California, Irvine

B.S. in Mathematics - Concentration in Data Science

Irvine, CA

2018–2021

Fullerton College

A.S. in Mathematics

Fullerton, CA

2016–2018

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

Experience

Woods Hole Oceanographic Institution

Graduate Research Assistant

Sep 2021–Present

Woods Hole, MA

- Designed and ran global ocean simulations using the MIT General Circulation Model (MITgcm) to test mechanisms controlling deep ocean heat content and circulation
- Evaluated high-resolution coupled climate models to quantify the impacts of Antarctic sea ice melt on global ocean circulation and tracer distributions
- Analyzed ocean reanalysis data and found a statistical relationship between near-shore sea surface temperature variability and extreme California precipitation events
- Developed Python and Julia tools for processing and analysis of ocean model and observational data in high-performance computing (HPC) environments

Foundation for Resilient Societies

Technical Consultant

Jan 2025

Cambridge, MA

- Ran and debugged Strategic Energy & Risk Valuation Model (SERVM) simulations to assess U.S. electrical grid capacity adequacy under varying generation scenarios (e.g., solar adoption).
- Led a team of 12 undergraduate electric grid modeling interns to develop an internal user guide for running SERVM experiments and interpreting model output.

Los Alamos National Laboratory

Research Intern

Jun 2021–Aug 2021

Los Alamos, NM

- Implemented and evaluated reduced-precision in the Energy Exascale Earth System Model (E3SM) to reduce computational cost and energy consumption in global simulations

Institute for Pure and Applied Mathematics & The Aerospace Corporation

Research Intern

Jun 2020–Sep 2020

Los Angeles, CA

- Designed and implemented reinforcement learning-based methods for adaptive packet routing in satellite network simulations, implemented in Python using PyTorch

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

Professional Activities

- 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*.

Skills

Languages: Programming: Python, Julia, MATLAB; Human: English, Spanish

Scientific Computing: NumPy, SciPy, xarray, Pandas, Optimization.jl, JuMP.jl, scikit-learn, PyTorch

HPC & Dev Tools: Unix/Linux, OpenMPI, HPC job schedulers (e.g., Slurm), Dask, Git, GitHub

Professional References

Geoffrey Gebbie (ggebbie@whoi.edu)

Henri Drake (hdrake@uci.edu)

Christopher Piecuch (cpiecuch@whoi.edu)