Anthony Meza

Ph.D. Candidate
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Education

Massachusetts Institute of Technology & Woods Hole Oceanographic Institution — Cambridge, MA
Ph.D. in Physical Oceanography — *Expected 2026*

University of California, Irvine — Irvine, CA
B.S. in Mathematics - Concentration in Data Science — *2018–2021*

Fullerton College — Fullerton, CA
A.S. in Mathematics — *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 — Sep 2021–Present
Graduate Research Assistant — *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 — Jan 2025
Technical Consultant — *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 — Jun 2021–Aug 2021
Research Intern — *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 — Jun 2020–Sep 2020
Research Intern — *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 — *2024*
  High Performance Computing and Data Analysis Workshop
- Calculus Instructor — *2024*
  MIT-WHOI Joint Program Summer Math Refresher
- Partial Differential Equations Instructor — *2023*
  MIT-WHOI Joint Program Summer Math Refresher

Professional Activities

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

Workshops and Summer Schools Attended

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

Awards and Honors Received

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

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)