

# Elizabeth Yankovsky

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## EDUCATION

**Princeton University**, Princeton, NJ

Ph.D., Atmospheric and Oceanic Sciences, *2015 – 2020*.

Thesis: Modeling & parameterizing submesoscale turbulence in dense Arctic flows

Advisor: Dr. Sonya Legg

**University of South Carolina Honors College**, Columbia, SC

Thesis: Methane hydrates and cellular convection in the Central Aleutian Basin

B.S., Physics and Geophysics, *2011-2015*

Advisors: Drs. Camelia Knapp and Darrell Terry

## APPOINTMENTS

**Yale University**, New Haven, CT

Assistant Professor in Earth and Planetary Sciences, *July 2024-present*

**[C]Worthy**, Boulder, CO

Postdoctoral Researcher, *2023-2024*

Mentors: Drs. Matthew Long, Alicia Karspeck, Scott Bachman

**Courant Institute, New York University**, New York, NY

Postdoctoral Associate, Center for Atmosphere Ocean Science, *2020-present*

Mentors: Drs. Laure Zanna and Shafer Smith

**NOAA Geophysical Fluid Dynamics Laboratory, Princeton University**

Graduate Research Assistant, Ocean & Ice Processes Group, *2015-2020*

Mentors: Drs. Sonya Legg, Robert Hallberg, Rong Zhang

**Geophysical Exploration Laboratory, University of South Carolina**

Undergraduate Research Assistant, *2012-2015*

Mentors: Drs. Camelia Knapp, Darrell Terry

**Oregon State University, College of Earth, Ocean, & Atmospheric Sciences**

NSF-REU program intern, *June-August 2014*

“Response of the Length and Stratification of the North River Estuary to Changes in Forcing”, Mentor: Dr. James Lerczak

**Rutgers University, Department of Marine and Coastal Sciences**

NSF-REU program intern, *June-August 2013*

“Quantifying Turbulent Dissipation in a Shallow Estuarine Environment”

Mentor: Dr. Robert Chant

## AWARDS

**2024 Council of the American Meteorological Society Editor's Award – JPO**

**2017 National Science Foundation Graduate Research Fellowship**

**2011 National Merit Scholarship**

## TEACHING

**Yale EPS 216 Global Warming: Climate Physics.** Taught with John Wettlaufer, Spring 2025.

**Princeton Instructor Assistant:** Introduction to Ocean Physics for Climate (GEO-MAE 425). Taught by Gabriel Vecchi, Fall 2018.

**Teaching Transcript Program**, Princeton McGraw Center, completed 2020.

## PUBLICATIONS

**Yankovsky, E.**, M. Zhou, M. Tyka, S. Bachman, D. Ho, A. Karspeck, and M. Long, 2024: Impulse response functions as a framework for quantifying ocean-based carbon dioxide removal. *[Under review in Biogeosciences.]*

Zhou, M., M. Tyka, D. Ho, **E. Yankovsky**, S. Bachman, T. Nicholas, A. Karspeck, M. Long, 2024: Mapping the global variation in the efficiency of ocean alkalinity enhancement for carbon dioxide removal. *Nature Climate Change*.

**Yankovsky, E.**, S. Bachman, K. S. Smith, L. Zanna, 2024: Backscatter parameterization of ocean mesoscale eddies informed by vertical structure. *Journal of Advances in Modeling Earth Systems*.

**Yankovsky, E.**, A. Yankovsky, 2023: The cross-shelf regime of a wind-driven supercritical river plume. *Journal of Physical Oceanography*.

**Yankovsky, E.**, L. Zanna, K. S. Smith, 2022: Influences of mesoscale ocean eddies on flow vertical structure in a resolution-based model hierarchy. *Journal of Advances in Modeling Earth Systems*.

Marques, G., N. Loose, **E. Yankovsky**, J. Steinberg, C. Chang, N. Bhamidipati, A. Adcroft, B. Fox-Kemper, S. Griffies, R. Hallberg, M. Jansen, H. Khatri, L. Zanna, 2022: NeverWorld2: An idealized model hierarchy to investigate ocean mesoscale eddies across resolutions. *Geoscientific Model Development*.

N. Loose, R. Abernathey, I. Grooms, J. Busecke, A. Guillaumin, **E. Yankovsky**, G. Marques, J. Steinberg, A. S. Ross, H. Khatri, S. Bachman, L. Zanna, P. Martin, 2022: GCM-Filters: A Python package for diffusion-based spatial filtering of gridded data. *Journal of Open Source Software*.

I. Grooms, N. Loose, R. Abernathey, J. Steinberg, S. Bachman, G. Marques, A. Guillaumin, **E. Yankovsky**, 2021: Diffusion-based smoothers for spatial filtering of gridded geophysical data. *Journal of Advances in Modeling Earth Systems*.

**Yankovsky, E.**, S. Legg, R. Hallberg, 2021: Parameterizing submesoscale symmetric instability and frontal mixing in dense flows along topography. *Journal of Advances in Modeling Earth Systems*.

**Yankovsky, E.**, S. Legg, 2019: Symmetric and baroclinic instability in dense shelf overflows. *Journal of Physical Oceanography*.

**Yankovsky, E. A.**, D. A. Terry, C. C. Knapp, 2015: Seismic and gravity evidence for methane-hydrate systems in the central Aleutian Basin. *International Journal of Earth Science and Geophysics*.

## SELECTED SEMINARS AND TALKS

### INVITED TALKS

Links between eddy horizontal and vertical structure: a geostrophic turbulence interpretation. *Climate Applications of Layering Workshop, Isaac Newton Institute for Mathematical Sciences*, University of Cambridge; and *Theoretical and Practical Perspectives in Geophysical Fluid Dynamics Program*, International Center for Theoretical Sciences, Bengaluru, India (virtual), 2024.

Impulse response functions as a framework for quantifying carbon uptake associated with ocean alkalinity enhancement. *Spring Symposium on Marine Carbon Dioxide Removal*, Yale University (YCNCC), 2024.

A backscatter-only parameterization for mesoscale eddies. *IUGG 2023 General Assembly*, Berlin, Germany, 2023.

The vertical structure of mesoscale ocean eddies. *Atmosphere Ocean Science Colloquium*, Courant Institute, New York University, 2023.

Improving ocean models across scales: techniques, progress, and open questions. *AOCD Spring Seminar Series*, Yale University, 2023.

The role of ocean turbulence in climate. *The Department of Earth and Planetary Sciences Colloquium*, Yale University, 2023.

Modeling & parameterizing mesoscale eddies in the Arctic Ocean. *US Interagency Arctic Research Policy Committee* modeling team meeting, 2022.

Parameterizing mesoscale eddy energetics and vertical structure at eddy-permitting resolutions. *NCAR Oceanography Seminar*, Boulder, CO, 2022.

Influences of mesoscale ocean eddies on flow vertical structure. *Oceans Research Group Seminar*, University of Oxford, 2022.

Modeling and parameterizing submesoscale turbulence in dense Arctic overflows. *Atmosphere, Ocean and Climate Sack Lunch Seminar Series*, MIT EAPS, 2021.

Constraining water mass transformation and overflow dynamics on the Arctic shelves. *Polar Oceans Seminar Series*, British Antarctic Survey, 2021.

Symmetric instability in Arctic dense gravity currents. *Seminar in Applied and Computational Mathematics*, University of Edinburgh, Scotland, 2019.

Modeling baroclinic and submesoscale instabilities in the Arctic Ocean. *AOCD Fall Seminar Series*, Yale University, 2018.

#### CONFERENCE PRESENTATIONS

Multi-resolution regional modeling to investigate variability in the carbon uptake efficiency of ocean alkalinity enhancement. *AGU Fall Meeting*, 2024.

Mesoscale turbulence in the context of marine carbon dioxide removal. *Climate Process Team Annual Meeting: Ocean Transport and Eddy Energy*, Brown University, 2024.

Evaluation of “Impulse Response Functions” as a framework for quantifying carbon uptake associated with ocean alkalinity enhancement. *Ocean Sciences Meeting*, New Orleans, LA, 2024 and *Ocean Model Working Group Meeting*, NCAR, Boulder, CO, 2024.

Exploring mesoscale eddy vertical structure regimes in the global ocean. *AGU Fall Meeting*, 2022.

Influences of mesoscale ocean eddies on flow vertical structure. *Ocean Sciences Meeting*, 2022; *Climate Process Team Annual Meeting: Ocean Transport and Eddy Energy*, Boulder, CO, 2022.

Effects of eddy representation on vertical structure and energetics. *CESM Ocean Model Working Group Meeting*, 2021.

Constraining Arctic water mass transformation and ventilation pathways in the GFDL-OM4.0. *AGU Fall Meeting*, 2020.

Modeling vertical transport and submesoscale frontal mixing in dense flows along topography. *Ocean Sciences Meeting*, San Diego, CA, 2020.

Symmetric and baroclinic instability in dense shelf overflows. *EGU General Assembly*, Vienna, Austria, 2019.

Symmetric instability in dense shelf overflows. *Ocean Sciences Meeting*, Portland, OR, 2018.

Dense water formation and transport on the Arctic continental shelves. *Forum for Arctic Ocean Modeling and Observational Synthesis (FAMOS)*, Woods Hole Oceanographic Institution, MA, 2017.

Response of the length and stratification of the North River estuary to changes in forcing. *AGU Fall Meeting*, San Francisco, CA, 2014.

PROFESSIONAL  
SERVICE

**Associate Editor** for Journal of Geophysical Research: Machine Learning and Computation, 2024-present.

**Committee Member** for American Physical Society: Topical Group on the Physics of Climate election, 2024.

**Reviewer for:** Journal of Physical Oceanography, Ocean Modelling, Journal of Advances in Modeling Earth Systems, Geophysical Research Letters, Environmental Fluid Mechanics, Journal of Geophysical Research: Oceans, NSF, NASA NSPIRES program.

**Convener and chair** for the session “Multiscale Eddy Dynamics and Tracer Transport: Bridging Observations, Theory, and Modeling” at Ocean Sciences Meeting, 2024.

**Convener and chair** for the session “Mesoscale Eddy Energy and Ocean Transport” at Ocean Sciences Meeting, 2022.

UNIVERSITY  
SERVICE

**UCAR Annual Members Meeting** Yale EPS substitute representative, 2024.

**Scientific Leadership Team:** Center for Natural Carbon Capture.

**Faculty Affiliate:** Yale Institute for Biospheric Studies.

**Co-organizer:** Atmosphere, Oceans, Climate Dynamics seminar, 2024.

**NYU-CAOS Colloquium Organizing Committee** (2022), **Planning Committee** for the yearly Princeton AOS Program Orientation and Retreat (2018), AOS Program **Student-Faculty Representative** (2017-18).

WORKSHOPS

**Climate Applications of Layering**, Isaac Newton Institute for Mathematical Sciences, University of Cambridge, May 2024.

**Machine Learning and Climate Modeling:** Princeton AOS, July 2019.

**Convection in Nature:** Princeton Center for Theoretical Science, Feb. 2018.

**Forum for Arctic Modeling and Observational Synthesis (FAMOS):** Woods Hole Oceanographic Institution, Oct. 2017.

**Les Houches Summer School on Fundamental Aspects of Turbulent Flows in Climate Dynamics:** Les Houches Physics School, Aug. 2017.

COMPUTER  
EXPERIENCE

**Regional Ocean Modeling System (ROMS):** high-resolution, realistic simulations aimed at studying ocean alkalinity enhancement for carbon removal.

**MIT General Circulation Model (MITgcm):** idealized non-hydrostatic simulations of dense gravity currents, coastal buoyant plume dynamics, LES.

**GFDL Modular Ocean Model (MOM6):** idealized and regional simulations; analysis of global models including CM2.6 and OM4, model development.

**Other:** Python, MATLAB, GitHub, Jupyter, LaTeX, Fortran, shell scripting.

#### OUTREACH

**Yale-New Haven Teachers Institute:** developing lectures to present to local public school teachers, 2024-present.

**STEM Professionals Day** at PS154 in Brooklyn – volunteer, 2022.

**NJ Ocean Fun Days, Estuary Day, Environment Day** – volunteer, 2017-19.

**Young Women's Conference in Science, Technology, Engineering & Mathematics** (Princeton Plasma Physics Laboratory) – volunteer, 2018-19.

**Plainsboro Library** – developed youth program “Motion in the Ocean”, 2017.

**Future City** – member of local nonprofit organization aimed at educating communities about environmental issues, working with policy-makers, and developing environmental initiatives, 2016-18.

**Environmental Protection Agency: Trash Free Waters** – attended meetings to discuss pollution issues facing New York and New Jersey waterways, 2017.