

# DYLAN SCHLICHTING

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## EDUCATION

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Ph.D. Oceanography, Texas A&M University 2020 - 2024  
Dissertation: Numerical and physical mixing in simulations of submesoscale baroclinic instabilities over sloping bathymetry  
Committee: Robert Hetland (co-chair), Henry Potter (co-chair), Spencer Jones, Scott Socolofsky  
  
B.S. Civil Engineering, University of Maine 2016 - 2019  
Minor: Mathematics  
Honors: *cum laude*

## RESEARCH INTERESTS

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Spurious/numerical mixing, coastal/regional ocean modeling, submesoscale dynamics, river plume dynamics, estuarine exchange flow.

## RESEARCH EXPERIENCE

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**Postdoctoral Researcher** Aug 2024 - Present  
*Los Alamos National Laboratory*

- Improving MPAS-O's representation of submesoscale dynamics.
- Quantifying physical and numerical mixing in MPAS-O simulations.

**DOE SCGSR Fellow** 2023 - 2024  
*Los Alamos National Laboratory*

- Developed an unprecedented submesoscale eddy-permitting mesh with the Model for Prediction Across Scales - Ocean (MPAS-O).
- Assessed MPAS-O's representation of submesoscale coastal processes over the Texas-Louisiana (TXLA) Shelf.

**Graduate Research Assistant** 2020 - 2023  
*Texas A&M University: Dept. Oceanography*

- Characterized numerical mixing in two-way nested Regional Ocean Modeling System (ROMS) simulations over the TXLA shelf.
- Developed ROMS simulations of idealized submesoscale baroclinic instabilities.

**Student Research Assistant** 2017 - 2019  
*UMaine: Dept. Civil Engineering*

- Analyzed the environmental impacts of living shorelines and coastal armoring structures on pocket beaches in Southern Maine.

- Participated in the construction, deployment, and management of an oceanographic mooring system for the Sensing Storm Surge Citizen Science Project (<http://sensingstormsurge.acg.maine.edu/>).

#### **Engineering Research Assistant**

2018 - 2019

UMaine: School of Marine Sciences

- Characterized inertial oscillations in the Gulf of Maine using observational current data.

#### **Research Experience for Undergraduates**

2018

Texas A&M University: Dept. Oceanography

- Characterized salinity structure in Copano Bay, TX using ROMS output.
- Cruise: R/V Pelican (3 days). Cocodrie, LA, to Flower Garden Banks National Marine Sanctuary in the northern Gulf of Mexico.

### **PUBLICATIONS**

4. **Schlichting, D.**, Hetland, R., & Jones, S. Numerical mixing suppresses submesoscale baroclinic instabilities over sloping bathymetry. *Journal of Advances in Modeling Earth Systems*. In-press.
3. **Schlichting, D.**, Qu, L., Kobashi, D., & Hetland, R. (2023). Quantification of physical and numerical mixing in a coastal ocean model using salinity variance budgets. *Journal of Advances in Modeling Earth Systems*, 15, e2022MS003380. <https://doi.org/10.1029/2022MS003380>.
2. Qu, L., Hetland, R., & **Schlichting, D.** Mixing pathways in simple box models (2022). *Journal of Physical Oceanography*, 52(11), 2761-2772. <https://doi.org/10.1175/JPO-D-22-0074.1>.
1. Spicer, P., **Schlichting, D.**, Huguenard, K., Roche, A., & Rickard, L. (2021). Sensing Storm Surge: A framework for establishing a citizen scientist monitored water level network. *Ocean and Coastal Management*, 211, 105802. <https://doi.org/10.1016/j.ocecoaman.2021.105802>.

### **MANUSCRIPTS IN PROGRESS**

3. Hinson, K., Hetland, R., Engwirda, D., Smith, K.M., & **Schlichting, D.** Representation of submesoscale baroclinic instabilities in ROMS and MPAS-O. *Journal of Advances in Modeling Earth Systems*. In-revision.
2. Wei Hsu, F., **Schlichting, D.**, Shearman, R. Kipp, Kobashi, D., & Hetland, R. Near-Resonance between the shelf ocean and semidiurnal atmospheric tidal winds. *Journal of Physical Oceanography*. In-revision.
1. Hilditch J., Bergentz, K., Dias-Luko, C., Northcott D., Cohananim K., Sanchez-Rios A., **Schlichting, D.**, Weiss, K., Thomas, L.N., MacKinnon, J., & Nash, J. Oceanic occluded fronts and downward submesoscale heat fluxes in the Northern Gulf of Mexico. Intent to submit to *Journal of Geophysical Research: Oceans*.

### **INVITED PRESENTATIONS**

2. **Schlichting, D.** (2022). An introduction to numerical mixing in a coastal ocean model of the Texas-Louisiana continental shelf. Submesoscales Under Near-Inertial Shear Experiment Meeting, Bend, OR, Dec 11. *Talk*.
1. **Schlichting, D.,** Qu, L., Hetland, R., & Kobashi, D. (2022). Quantification of physical and numerical mixing using tracer variance dissipation in a coastal ocean model. Pacific Northwest National Laboratory Coastal Modeling Group, Jul 11. *Talk, virtual*.

## ACADEMIC PRESENTATIONS / CONFERENCES

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16. **Schlichting, D.** (2024). Numerical and physical mixing in simulations of submesoscale baroclinic instabilities over sloping bathymetry. Dissertation defense, College Station, TX, May 2. *Talk*.
15. **Schlichting, D.,** Hetland, R., & Jones, S. (2024). Numerical mixing suppresses submesoscale baroclinic instabilities over sloping bathymetry. Ocean Sciences Meeting, New Orleans, LA, Feb 18-23. *Poster*.
14. **Schlichting, D.,** & Hetland, R. (2023). Numerical mixing in idealized simulations of baroclinic instabilities over a shelf. Gordon Research Seminar/Conference on Coastal Ocean Dynamics, Smithfield, RI, Jun 17-23. *Poster*.
13. Texas Center for Climate Studies High Resolution Earth System Modelling Workshop (2023). College Station, TX, Jan 23-25. *Attended*.
12. **Schlichting, D.,** Qu, L., Hetland, R., & Kobashi, D. (2022). Quantification of physical and numerical mixing using tracer variance dissipation in a coastal ocean model. Gordon Research Seminar/Conference on Ocean Mixing, South Hadley, MA, Jun 4-10. *Poster*.
11. Hetland, R., Qu, L., & **Schlichting, D.** (2022). Tracer variance mixing in simple box models. Ocean Sciences Meeting, Feb 24 - Mar 4. *Talk, virtual*.
10. **Schlichting, D.,** Qu, L., Hetland, R., & Kobashi, D. (2022). Using salinity variance budgets to quantify numerical mixing in a coastal ocean model. Ocean Sciences Meeting, Feb 24 - Mar 4. *Talk, virtual*.
9. **Schlichting, D.,** Hetland, R., Qu, L., & Kobashi, D. (2021). Using tracer variance budgets to quantify numerical mixing offline in a coastal ocean model. Warnemünde Turbulence Days Meeting. Dec 6-9. *Talk, virtual*.
8. Scientific Computing with Python Conference (2021). Jul 12-18. *Attended, virtual*.
7. Scientific Computing with Python Conference (2020). Jul 6-12. *Attended, virtual*.
6. **Schlichting, D.,** Lieberthal, B., & Huguenard, K. (2019). An assessment into vegetation farms as a solution to coastal erosion in southern Maine. Northeast Aquaculture Conference, Boston MA. Jan 9-11. *Poster*.
5. **Schlichting, D.** & Hetland, R. (2018). Using salinity variance and total exchange flow to analyze salinity structure in an unsteady estuary. Physics of Estuaries and Coastal Seas Conference, Galveston, TX, Oct 14-18. *Poster*.
4. **Schlichting, D.** & Hetland, R. (2018). Mechanisms controlling salinity structure structure in a broad, shallow, unsteady estuary. Sustainable Ecological Aquaculture Network Undergraduate Research Symposium, Walpole, ME, Aug 7. *Poster*.

3. **Schlichting, D.** & Hetland, R. (2018). Salinity structure in Copano Bay. Texas A&M University Observing the Ocean REU Student Symposium, College Station, TX, Aug 2. *Talk*.
2. **Schlichting, D.**, Lieberthal, B., & Huguenard, K. (2017). Vegetation farms as a solution to coastal erosion for Saco, Maine. Sustainable Ecological Aquaculture Network Undergraduate Research Symposium, Walpole, ME, Aug 16. *Poster*.
1. Coastal and Estuarine Research Federation Conference (2017). Providence, RI, Nov 5-9. *Attended*.

## SERVICE & MENTORING

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Reviewer: <i>Journal of Geophysical Research: Oceans</i> ( $n = 4$ )	
Mentor: Kaila Uyeda (Postbac Researcher)	Fall 2023
Judge: Student Research Week	Spring 2023
NSF PROGRESS Mentor - Milly Hencey	Fall 2022
Judge: Environmental Geosciences capstone (GEOS 405, TAMU)	Spring 2022
Tutor: Computers in Civil Engineering (CIE 115, UMaine)	Spring 2019

## FUNDED RESEARCH

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DOE SCGSR fellow ( $\sim \$30,100$ )	2023-2024
Oceanography Graduate Council mini-grant ( $n = 3$ , \$1300 total)	2021

## HONORS AND AWARDS

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Louis and Elizabeth Scherck Scholarship ( $n = 4$ )	2020 - 2024
NSF S-STEM Scholar ( $n = 2$ )	2020 - 2021
Frank Sleeper - Sawyer Scholarship	2017 - 2019
Best civil engineering capstone project	2019
Chi Epsilon member	2019
NSF REU Scholar	2018
Alpha Tau Omega Memorial Scholarship	2018

## SKILLS

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- Modeling tools: ROMS (proficient), COAWST (proficient), MPAS-O (basic), E3SM (basic)
- Programming & related: Python (proficient),  $\text{\LaTeX}$  (proficient), Markdown (proficient), Matlab (intermediate), Bash (intermediate), Github/Git (intermediate), FORTRAN (basic)
- Ocean observations (basic): HOBO water level and conductivity sensors, ADCPs, ADVs
- Civil engineering (basic): HEC-RAS, AutoCad, Revit

## PROFESSIONAL SOCIETIES

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- American Geophysical Union
- Association for the Sciences of Limnology and Oceanography

- The Oceanography Society