

# DYLAN SCHLICHTING

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## EDUCATION

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Ph.D. Oceanography, Texas A&M University Jan 2020 - Aug 2024 (Expected)  
Committee: Robert Hetland (co-chair), Henry Potter (chair), Spencer Jones, Scott Socolofsky  
Dissertation: Numerical mixing in submesoscale baroclinic instabilities over sloping bathymetry

B.S. Civil Engineering, University of Maine Aug 2016 - Dec 2019  
Minor: Mathematics.  
Honors: *cum laude*

## RESEARCH INTERESTS

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Spurious/numerical mixing, coastal ocean modeling, submesoscale processes and dynamics, estuarine exchange flow and mixing.

## RESEARCH EXPERIENCE

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**DOE SCGSR Fellow** Dec 2023 - Present  
*Los Alamos National Laboratory*

- Assessing the role of coastal processes in the Model for Prediction Across Scales - Ocean (MPAS-O) over the Texas-Louisiana (TXLA) shelf
- Learning grid generation and simulation development with unstructured ocean models

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

- Characterized numerical mixing in a high-resolution ocean model (COAWST/ROMS) of the TXLA shelf as part of the Submesoscales Under Near-Resonant Inertial Shear Experiment (SUNRISE, <https://sunrise-nsf.github.io/>)
- Developed idealized ROMS simulations of submesoscale baroclinic instabilities for a coastal shelf
- Contributed to the development of modern, python-based post-processing packages for C-grid ocean model output (xroms, xarray, xgcm)

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

- Used analytical modeling to study the interaction of flow and suspended kelp farms.
- Analyzed the environmental impacts of coastal armoring structures on pocket beaches in Southern Maine using empirical orthogonal functions.
- 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**  
*UMaine: School of Marine Sciences*

Aug 2018 - May 2019

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

**Research Experience for Undergraduates**  
*Texas A&M University: Dept. Oceanography*

May 2018 - Aug 2018

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

**PUBLICATIONS**

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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 PREPARATION**

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2. **Schlichting, D.**, & Hetland, R. Numerical mixing suppresses submesoscale baroclinic instabilities over sloping bathymetry.
1. Wei Hsu, F., Shearman, R. Kipp, **Schlichting, D.**, Kobashi, D., & Hetland, R.  $S_2$  Atmospheric Tide Driven Superinertial Oscillation on the Texas-Louisiana Shelf. Intent to submit to *Journal of Physical Oceanography*.

**INVITED PRESENTATIONS**

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2. **Schlichting, D.** (2022). An introduction to numerical mixing in a coastal ocean model of the Texas-Louisiana continental shelf. SUNRISE student cruise meeting. Dec 11. Bend, OR. *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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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, 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, 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*.
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*.
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*.
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. October 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. August 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. August 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. August 16. *Poster*.
1. Coastal and Estuarine Research Federation Conference (2017). Providence, RI, Nov 5-9. *Attended*.

## SERVICE & MENTORING

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Mentor: Kaila Uyeda (Postbac Researcher)	Aug. 2023 - Dec. 2023
Reviewer: <i>Journal of Geophysical Research: Oceans</i> ( $n = 1$ )	Aug. 2023 - Present
Judge: Student Research Week (multiple sessions)	Spring 2023
NSF PROGRESS Mentor - Milly Hencely	Fall 2022
Judge: Environmental Geosciences (GEOS 405, TAMU)	Spring 2022
Tutor: Computers in Civil Engineering (CIE 115, UMaine)	Spring 2019

## HONORS AND AWARDS

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DOE Office of Science and Graduate Student Research Program (SCGSR)	Dec. 2023-Present
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Louis and Elizabeth Scherck Scholarship (X4)	2020-Present
NSF S-STEM Scholar (X2)	Jan 2020 - Aug 2021
Oceanography Graduate Council mini-grant recipient (X3)	2021
Frank Sleeper - Sawyer Scholarship	2017 - 2019
Best civil engineering capstone project	2019
Chi Epsilon Member: Civ. Eng. Honors Society	2019
NSF Research Experience for Undergraduates Scholar	May 2018 - Aug 2018
Alpha Tau Omega Memorial Scholarship	2018

## SKILLS

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- Ocean modeling: Experience with ROMS/COAWST & MPAS-O,
- Programming & Related: Python, Matlab,  $\text{\LaTeX}$ , Markdown, Bash, FORTRAN, Linux administration, high performance computing
- Basic website design with GitHub Pages, HTML, Ruby, and CSS
- Ocean observations: HOBO water level and conductivity sensors, basic experience with ADCPs and ADVs
- Open science: GitHub/git, Zenodo, GLOBUS
- Civil engineering: Concrete mooring design, basic experience with HEC-RAS, AutoCad, and Revit

## PROFESSIONAL SOCIETIES

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