# LILIAN MICHELLE ENGEL

lily dot engel at pnnl dot gov

## EDUCATION

**PhD** **Civil and Environmental Engineering** August 2023
University of California, Berkeley
Dissertation: *Into the Plankter-Verse: Physical-Biological Interactions in Estuaries*
UC San Diego Scripps Institution of Oceanography, inter-campus exchange

**MS** **Civil and Environmental Engineering** May 2019
University of California, Berkeley

**BS** **Biosystems Engineering** May 2018
**BS** **Mathematics** May 2018
University of Arizona
Honors and Summa Cum Laude
Minors in Spanish and Mechanical Engineering
University of Queensland, study abroad

## RESEARCH EXPERIENCE

**Postdoctoral Researcher, Pacific Northwest National Lab** 2023-Present
Mentor: Dr. Lysel Garavelli

- Developed a larval dispersal biophysical model using the Salish Sea Model for an invasive crab species, the European Green Crab.
- Interacted with Tribal Nations and Federal/State agencies for data organization.
- Implemented a larval dispersal biophysical model to analyze the effects of offshore wind on three commercial US fish species.
- Evaluated the spread of PCBs in the Puget Sound using the Salish Sea Model.
- Participated in two field campaigns to collect eDNA of the European Green Crab in different parts of the Salish Sea.

**Dissertation, UC Berkeley Civil and Environmental Engineering** 2023
Advisor: Dr. Mark Stacey

- Investigated how time variable exchange between a channel and shoal in San Francisco Bay influences biomass with an interacting water columns model.
- Explored the interaction of sinking particles and estuarine exchange flow to recreate the estuarine turbidity maximum in a simplified longitudinal model.
- Developed The Peter-Parker Model: an ecophysical model which combined estuarine physics with a NPZD ecosystem model to explore how human impacts and other climate change scenarios affect the interaction of estuarine flow with ecosystem processes in an estuary.

- Participated/presented work in the UC Berkeley EFMH lab group, the Franks lab group at Scripps, the COMPASS-GLM team meetings, the University of Washington EFM group, and the MacCready group at UW.

## TEACHING EXPERIENCE

**Graduate Student Instructor, UC Berkeley CEE** Spring 2021
Advisor: Dr. Mark Stacey

- Graduate level course titled *Environmental Fluid Mechanics II*.
- Explored application of a water column model to various environmental scenarios.
- Led a discussion section once every two weeks, held regular office hours, and helped prepare the coursework.

## SERVICE/AFFILIATIONS

Washington Ocean Acidification Center Research Cruise Summer 2023

Western Coastal Collaboratorium (WCC) Seminar Planning Committee 2022-2023

Environmental Engineering Graduate Student Admissions Committee Spring 2022

Civil and Environmental Engineers for Anti-Racism 2020-2022

Environmental Engineering Seminar Planning Committee Fall 2019

Environmental Engineering Advocacy Team 2018-2022

## HONORS AND AWARDS

**Student Poster Award** 2023
Gordon Research Conference: Coastal Ocean Dynamics

**National Science Foundation Graduate Research Fellowship Program** 2018
Awarded 2018, on tenure 2019, 2021, and 2022.

**Department Award** 2018
Financial assistantship for MS degree.

## SKILLS

**Programming**: Python, MATLAB, C, Julia, Java

**Applications**: Solidworks, Excel/VBA, FVCOM

**Other**: Passed FE Exam, Intermediate Spanish, Beginner French

## CONFERENCE PRESENTATIONS

**American Geophysical Union Fall Meeting** (Washington, D.C. - talk) 2024
*Modeling larval dispersal and its implications for marine ecosystem management*

**American Fisheries Society Meeting** (Honolulu, HI – talk) 2024
*Influence of offshore wind on larval dispersal of US commercial species*

**Ocean Sciences Meeting** (New Orleans, LA - talk) 2024
1. *Coastal ecosystem vulnerability to an invasive species – the European Green Crab*
2. *The Peter-Parker Model vs The Sandman: How does the interaction of particle sinking and estuarine flow lead to Estuarine Turbidity Maxima (ETM)?*

**Coastal & Estuarine Research Federation 2023 Conference** (Virtual - talk) 2023
*The Peter-Parker Model: Breaking Apart Physical and Biological Contributions which Lead to Estuarine Phytoplankton Blooms*

**Gordon Research Conference: Coastal Ocean Dynamics** (Smithfield, RI - poster) 2023
*The Peter-Parker Model: Breaking Apart Physical and Biological Contributions which Lead to Estuarine Phytoplankton Blooms*

**American Geophysical Union Fall Meeting** (Chicago, IL - talk) 2022
*How Does Intermittency in Channel-Shoal Exchange Influence Biomass in an Estuarine Ecosystem?*

**Ocean Sciences Meeting** (Virtual - talk) 2022
*The Peter-Parker Model: Particle sinking and estuarine flow dynamics lead to estuarine phytoplankton blooms.*

## INVITED SPEAKER/LECTURER

**UW Tacoma Environmental Modeling Class Guest Lecture** (Tacoma, WA) 2024
*Environmental Modeling for European Green Crab Management*

**European Green Crab Larval Identification Workshop** (Padilla Bay, WA) 2024
*European Green Crab Larval Dispersal Modeling*

**Gordon Research Seminar: Coastal Ocean Dynamics** (Smithfield, RI) 2023
*The Peter-Parker Model: Breaking Apart Physical and Biological Contributions which Lead to Estuarine Phytoplankton Blooms*

**Western Coastal Collaboratorium** (University of Washington Seattle, WA) 2023
*The Peter-Parker Model: Breaking Apart Physical and Biological Contributions which Lead to Estuarine Phytoplankton Blooms*

## IN PREPARATION PUBLICATION LIST

Engel, L., Premathilake, L., Barrier, N., Khangaonkar, T., Garavelli, L. (In review). Connect-a-Crab: Larval Connectivity for European Green Crab Management in the Salish Sea

Garavelli, L., Engel, L., Hemery, L., Monim, Mahmud, Day, E., Codiga, Dan, Georgas, N. (In review). Navigating larval dynamics amid offshore wind development.

Engel, L. & Stacey, M. (In preparation). The Peter-Parker Model: How do human impacts and other climate change scenarios affect the interaction of estuarine flow with ecosystem processes in an estuary?

## PUBLICATION LIST

Engel, L., Lucas, L. & Stacey, M. The Role of Spring-Neap Phasing of Intermittent Lateral Exchange in the Ecosystem of a Channel-Shoal Estuary. Estuaries and Coasts 48, 22 (2025). https://doi.org/10.1007/s12237-024-01434-8

Engel, L.; Stacey, M. Timescales of Ecological Processes, Settling, and Estuarine Transport to Create Estuarine Turbidity Maxima: An Application of the Peter–Parker Model. Water 2024, 16, 2084. https://doi.org/10.3390/w16152084

## JOURNAL REVIEW

Reviewed manuscripts for *Estuaries and Coasts*, *PLOS ONE*.