LILIAN MICHELLE ENGEL

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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, GPA: 3.954/4.0
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

- Implemented a modeling tool to evaluate the effects of diel vertical migration on phytoplankton population dynamics in the Salish Sea Model.
- 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

Coastal & Estuarine Research Federation 2025 Conf. (Richmond, VI - talk) 2025

Impact of Zooplankton's Diel Vertical Migration on the Biogeochemical Cycle of a Deep Urban Estuary

Gordon Research Conf.: Coastal Ocean Dynamics (New London, NH - poster) 2025
Using real-world data to inform larval dispersal modeling for invasive species management

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 Conf. (Virtual - talk) 2023
The Peter-Parker Model: Breaking Apart Physical and Biological Contributions which Lead to Estuarine Phytoplankton Blooms

Gordon Research Conf.: 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

Salish Sea Roundtable (Virtual) 2025
Larval Connectivity of the European Green Crab

WDFW EGC Managers Symposium (Virtual) 2025
Larval Dispersal Modeling of the European Green Crab Update

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., Keller, A., Grason, E., Therriault, T., Makhlouf, B., Premathilake, L., Khangaonkar, T., Garavelli, L. (In preparation). Using real-world data to inform larval dispersal modeling for invasive species management.

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). Relative Contributions of River Flow and Terrestrial Nutrient Sourcing on Phytoplankton Concentration in an Estuary.

PUBLICATION LIST

Engel, L., Premathilake, L., Barrier, N., Khangaonkar, T., Garavelli, L. (2025) Larval connectivity for European green crab management in the Salish Sea and surrounding waters. Mar Ecol Prog Ser 754:77-92. https://doi.org/10.3354/meps14778

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.*