

## Catherine Mullenmeister

Scripps Institution of Oceanography  
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### Education

- 2021-Present **Scripps Institution of Oceanography**  
University of California, San Diego (La Jolla, CA)  
PhD Student, Biological Oceanography
- 2015-2020 **University of California, San Diego** (La Jolla, CA)  
B.S. in Marine Biology and B.S. in Environmental Chemistry  
*Magna Cum Laude Honors* (GPA 3.882), June 2020

### Research Interests

- Marine microbial community structure, chemical signaling, nutrient consumption, and competition in benthic ecosystems.
- Benthic ecology, microbial diversity, and microbial response to algal and coral interactions.
- Coral Reef management, resilience to environmental change, and dominant organism phase shifts.

### Research Appointments

- 2021-Present **PhD Student, Scripps Institution of Oceanography**  
**Ocean Biosciences Department**  
Advisors: Dr. Linda Wegley-Kelly and Dr. Jennifer Smith  
Current research project focused on analyzing how different classes of producers and their unique microbial communities change the dissolved organic matter pool through untargeted metabolomics on coral reef ecosystems. This work will help connect these biological interactions with physical properties on coral reefs such as oxygen, pH and dissolved organic matter trends that may influence benthic community structure.
- 2019-2020 **Research Assistant, UCSD Department of Chemistry and Biochemistry**  
Advisor: Dr. Kimberly Prather  
Studied the formation and cloud condensation nuclei activity of secondary marine aerosol created by the photo-oxidation of volatile organic compounds emitted from seawater during phytoplankton blooms. Operated instruments such as the cloud condensation nuclei counter, scanning mobility particle sizer, aerodynamic particle sizer, oxidative flow reactor and constructed a hygroscopic-tandem differential mobility analyzer system.
- 2018-2019 **Laboratory Technician, Scripps Institution of Oceanography, Institute of Geophysics and Planetary Science**  
Advisor: Dr. Todd Martz  
Studied seawater carbonate chemistry in the California Current ecosystem. Measured 1000+ California Cooperative Oceanic Fisheries Investigation seawater samples for physical properties such as, dissolved inorganic carbon and pH to monitor aquatic ecosystem dynamics, anthropogenic carbon inputs and changing coastal water conditions over long time periods. Operated spectrophotometric pH systems and measured inorganic carbon using a flow-injection analysis technique

- 2017-2018 **Research Assistant, Scripps Institution of Oceanography**  
Advisor: Dr. Adrienne Mora  
Engaged in systematic video analysis of parasite infected killifish to study behavioral ecology of the host populations and disease dynamics.

### **Teaching**

- 2020-Present **High School Science Teacher**  
*Lydian Academy (Menlo Park, CA)*  
Served as a chemistry, biology, and environmental science instructor in a remote setting at an accredited high school. Taught standard level and AP courses with virtual lab components that explore topics in STEM.
- 2017-2020 **Undergraduate Teaching Assistant**  
*University of California, San Diego*  
Served as a teaching assistant for two quarters of *BILD 3- Organismic and Evolutionary Biology (4 units)*. This course introduces students to the study of ecology and the complex interactions between living organisms and their environment that lead to speciation and evolutionary processes.
- Served as a teaching assistant for *BIEB 150- Evolution (4 units)*, an upper division course that explores agents of evolution at a population level through genetics, ecological context and mathematic manipulation of the Hardy-Weinberg equilibrium principle.

### **Awards and Honors**

- 2021 **Scripps First-Year PhD Student Fellowship**
- 2020 **UC San Diego Alumni Award**  
Awarded to one undergraduate student in Muir College for academic excellence and meaningful contribution to campus life.
- 2020 **Highest Distinction in Environmental Chemistry Departmental Honors Award**  
Awarded for a 3.8+ upper division major GPA, two quarters of independent study research and presentation of findings at the Undergraduate Research Symposium in Chemistry and Biochemistry.
- 2018 **John Muir College Caledonian Honors Society**  
Honors society for outstanding academic achievement, 3.8+ Cumulative GPA requirement with senior standing.
- 2016 **Professional Engineers in California Government Scholarship Award**
- 2015 **Mary Keith and Duff Memorial Scholarship**
- 2015 **CAASC Scholarship for Academic Performance and Community Service**
- 2015 **William Family Environmental Scholarship Award**

### **Presentations**

- 2020 **Undergraduate Research Symposium in Chemistry and Biochemistry** (poster presentation), "Characterizing the Cloud Condensation Nuclei Activity of Secondary Marine Aerosol."

- 2019 **Chemistry of Aerosol Impacts on the Environment Annual Meeting** (poster presentation), "Cloud Condensation Nuclei Activity of Secondary Marine Aerosol Observed during SeaSCAPE 2019."
- 2013 **Solano County Science Fair** (poster presentation), "The Effect of Water Toxicity on *Daphnia magna*." Second place poster award in the Environmental Science Division.

### ***Leadership Roles***

- 2018-2020 **John Muir College Senior Residential Advisor (RA)**  
Worked to create an active and inclusive university community as a Residential Advisor to approximately 180 residents through advising and social, educational and equity minded programming.
- 2017-2018 **John Muir College Academic Advising Peer Advisor**  
Met directly with students to discuss their academic goals and requirements, created course schedules, shared campus resources and developed plans for academic success.
- 2015-2017 **UCSD Outback Adventures Assistant Guide**  
Engaged in outdoor safety and activity skills training leading to a UC Certification in Outdoor Leadership. Assisted in leading sea kayaking, backpacking and snorkeling trips to provide students opportunities to explore local nature.

### ***Relevant Certifications***

- 2011 **Advanced Open Water PADI Scuba Diving Certification**

### ***Important Courses Taken***

- 2016-2020 Computer Modeling in Ecology and Evolution; Ecology Laboratory; The Coral Reef Environment; Instrumental Chemistry Laboratory; Statistical Methods in Marine Biology; Marine Biochemistry; Chemical Principles in Marine Systems; Phycology; Marine Plant Biology; Marine Biology Laboratory; Environmental Chemistry

### ***Publications***

- 2021 Mayer, K.J.; Moon, D.R.; Kilgour, D.; Sauer, J.S.; Moore, A.N.; Franklin, E.; Lee, C.; **Mullenmeister, C.**; Bahaveolos, C.; Ni, C.M.; Winter, M.; Bertram, T.H.; Cappa, C.D.; Prather, K.A "Coupled biological and photochemical control of secondary marine aerosol composition and cloud-forming ability." *Proceedings of the National Academy of Sciences*. (2021). *Under Review*.
- 2021 Sauer, J.; Mayer KJ.; Lee, C.; Alves ME.; Amiri, S.; Bahaveolos CJ.; Franklin, E.; Crocker, DR.; Dang, D.; Dinasquet J.; Garofalo, L.; Kaluarachchi CP.; Kilgour, DB.; Mael, LE.; Mitts, BA.; Moon, D.; Moore, AN.; Morris, CK. **Mullenmeister, C.**; Ni, CM.; Pendergraft MA.; Petras, D.; Simpson, R.; Smith S.; Tumminello, PR.; Walker, JL.; , DeMott, P.; Farmer, DK.; Goldstein, A.; Grassian, V.; Jaffe, J.; Malfatti. F.; Martz TR.; Slade, J.; Tivanski, AV.; Bertram, T.; Cappa, CD.; Prather, KA.; "The Sea Spray Chemistry and Particle Evolution Study (SeaSCAPE): Overview and Experimental Methods." *Environmental Science: Processes & Impacts*. (2021). *Accepted October 2021*.