JESSICA A. BULLINGTON

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Stanford University
Earth System Science

RESEARCH INTERESTS

I am a microbial ecologist and oceanographer. I use molecular genomic tools and statistical modeling to explore population dynamics and biodiversity of bacteria and archaea in aquatic ecosystems. I study the interaction of biogeochemical processes with microbial communities, microbial metabolism, and dissolved organic matter composition. I am equally interested in advocating for equity and social justice in academic science.

EDUCATION

2021 – present **Ph.D. Earth System Science**, 4.0 GPA
Stanford University, Doerr School of Sustainability
Thesis: "Meta-omic techniques reveal shifts in nitrogen cycling microbial community with sea level rise at the Stinson Beach subterranean estuary."
Advisors: Chris Francis, Ph.D. and Alexandria Boehm, Ph.D.

2018 – 2021 **M.S. Biological Oceanography**, 4.0 GPA
University of Hawai'i at Mānoa, School of Ocean and Earth Science and Technology
Thesis: "Modeling coastal pathogen populations: Advancements in predictive modeling of *Vibrio vulnificus* in a tropical urban estuary in Honolulu, Hawai'i."
Advisor: Craig Nelson, Ph.D.

2013 – 2017 **B.A. Biology with Highest Honors**, 4.0 GPA
University of California Santa Barbara, College of Creative Studies
Thesis: "Minimal crude oil exposure restructures the bacterioplankton community dynamics associated with laboratory cultures of *Emiliania huxleyi*."
Advisors: M. Debora Iglesias-Rodríguez, Ph.D. and Craig Carlson, Ph.D.

2015 University of California Education Abroad Program, 4.0 GPA
University of Queensland, School of Biological Sciences
Thesis: "Rubble with a cause: Questioning the validity of the Island Biogeography Theory for microhabitats on a coral reef."
Advisor: Ian Tibbetts, Ph.D.

PROFESSIONAL EXPERIENCE

2022 **Research Mentor**, Stanford University
Summer Undergraduate Research in Geosciences and Engineering (SURGE)

2021 – present **Stanford Graduate Fellow**, Stanford University
Environmental Microbiology, Chris Francis, Ph.D. (link)

2018 – 2021 **Graduate Research Assistant**, University of Hawai'i at Mānoa
Microbial Oceanography, Craig Nelson, Ph.D. (link)

2019 – 2021 **Senior Mentor**, University of Hawai‘i at Mānoa
SOEST Maile Mentoring Bridge (link)

2019 – 2020 **President**, University of Hawai‘i at Mānoa
Nā Kama Kai Oceanography Graduate Student Organization

2018 – 2020 **Assistant Program Coordinator**, University of Hawai‘i at Mānoa
Strategic Monitoring and Resilience Training Ala Wai, Brian Glazer, Ph.D. (link)

2019 **Research Intern**, Monterey Bay Aquarium Research Institute
Deep-sea Microbial Oceanography, Alex Worden, Ph.D. and Sebastian Sudek, Ph.D.

2018 – 2019 **Graduate Student Representative**, University of Hawai‘i at Mānoa
Biological Oceanography Division

2017 – 2018 **Curatorial Assistant**, Santa Barbara Museum of Natural History
Vertebrate and Invertebrate Zoology, Paul Valentich-Scott and Krista Fahy, Ph.D.

2017 **Environmental Consultant**, Blue Tomorrow, L.L.C.
Stream Ecology, Alex Dragos

2017 **Laboratory Technician**, U.S. Fish and Wildlife, Los Padres National Forest
Stream Ecology, Kristie Klose, Ph.D.

2014 – 2017 **Undergraduate Researcher**, University of California, Santa Barbara
Phytoplankton Physiology, M. Debora Iglesias-Rodríguez, Ph.D. (link) and
Microbial Oceanography, Craig Carlson, Ph.D. (link)

2016 **Undergraduate Research Assistant**, University of California, Santa Barbara
Sensory Ecology, Todd Oakley, Ph.D.

2015 – 2016 **Scientific Diver**, University of California, Santa Barbara
Marine Biological Observation Network, Robert Miller, Ph.D.

2013 – 2014 **Undergraduate Intern**, University of California, Santa Barbara
Santa Barbara Coastal Long Term Ecological Research, Daniel Reed, Ph.D.

TEACHING EXPERIENCE

2021 **Teaching Assistant**, University of Hawai‘i at Mānoa
OCN 105/SUST 115: Sustainability in a Changing World

2019 – 2020 **Course Coordinator**, University of Hawai‘i at Mānoa
OCN 750: Professional Career Development Seminar for Marine Scientists

2017 – 2018 **Teaching Assistant**, University of California, Santa Barbara
CHEM 1A and 1B: General Chemistry

2017 – 2018 **Tutor**, University of California, Santa Barbara
Campus Learning and Assistance Services

2014 – 2017 **Teaching Assistant**, University of California, Santa Barbara

PUBLICATIONS

2022 **Bullington, J. A.**, Golder, A. R., Steward, G. F., McManus, M. A., Neuheimer, A. B., Glazer, B. T., Nigro, O.D., and Nelson, C. E. (2022). Refining real-time predictions of *Vibrio vulnificus* concentrations in a tropical urban estuary by incorporating dissolved organic matter dynamics. *Science of The Total Environment*, 154075. (link)

2022 **Bullington, J. A.** (2022) Modeling Coastal Pathogen Populations: Advancements in Predictive Modeling of Vibrio vulnificus in a Tropical Urban Estuary in Honolulu, Hawai‘i. *University of Hawai'i at Manoa ProQuest Dissertations Publishing*. (link)

2019 **Bullington, J. A.**, Sudek, S., and Worden, A. (2019). Digging into DNA: Evaluating propidium monoazide as a tool to remove nonviable microbial DNA from deep-sea sediment cores. *Monterey Bay Aquarium Research Institute* online database. (link)

2018 Ladd, T. M., **Bullington, J. A.**, Matson, P. G., Kudela, R. M., and Iglesias-Rodríguez, M. D. (2018). Exposure to oil from the 2015 Refugio spill alters the physiology of a common harmful algal bloom species, *Pseudo-nitzschia australis*, and the ubiquitous coccolithophore, *Emiliania huxleyi. Marine Ecology Progress Series*, *603*, 61-78. (link)

2016 **Bullington, J. A.**, Mark, D., Griffrey, V., Bragg, A., Foster, W., and Tibbetts, I. (2016). Rubble with a cause: Questioning the validity of the Island Biogeography Theory for microhabitats on a coral reef. *Frontiers: The Interdisciplinary Journal of Study Abroad*.

2014 **Bullington, J. A.** (2014). Communication in Biology. *Starting Lines*. Ed. Ilene Miele and Christopher Dean. Plymouth: Hayden-McNeil Publishing. 13: 154-157. (link)

RESEARCH AND TRAVEL GRANTS

I have personally secured funding amounting to over $17,000 for several independently-motivated research projects and $1,500 for travel to conferences.

2019 **Graduate Student Organization Travel Grant**, University of Hawai‘i at Mānoa
“Biological-physical modeling to predict the dynamics of a pathogenic bacterium, *Vibrio vulnificus*, in an urbanized estuary in Hawai‘i.”
Role: Presenter at 2020 Ocean Sciences Meeting
Funding: $1000

2017 **Associated Students Coastal Fund**, University of California, Santa Barbara
“Coastal nutrient dynamics in the context of the 2015 Refugio State Beach oil spill.”
Role: Lead Evaluator (Principal Investigator: M. Debora Iglesias-Rodríguez, Ph.D.)
Funding: $9,683

2016 **Traveling Undergraduate Research Fund**, University of California, Santa Barbara
“Physiological responses of marine phytoplankton to oil exposure.”
Role: Presenter at North Pacific Marine Science Organization,
Pacific International Council for the Exploration of the Sea Meeting
Funding: $500

2016 **Worster Grant**, University of California, Santa Barbara

"The effects of the Refugio oil spill on phytoplankton in the Santa Barbara Channel."
Role: Co-Lead Evaluator (Principal Investigator: M. Debora Iglesias-Rodríguez, Ph.D.)
Funding: $5,000

2015 **Summer Undergraduate Research Fund**, University of California, Santa Barbara
"Are gametes well suited for environmental changes? Sensitivity of the dinoflagellate *Lingulodinium polyedrum* to climatic stressors."
Role: Lead Evaluator (Principal Investigator: M. Debora Iglesias-Rodríguez, Ph.D.)
Funding: $1,633

2014 **Undergraduate Research & Creative Activities**, University of California
"Are gametes more robust than asexual cells? Sensitivity of the dinoflagellate *Lingulodinium polyedrum* to climatic stressors."
Role: Lead Evaluator (Principal Investigator: M. Debora Iglesias-Rodríguez, Ph.D.)
Funding: $750

RESEARCH PRESENTATIONS

I have presented my research at 14 conferences including many student symposia and two international conferences. I was the invited keynote speaker for the 2017 UC Santa Barbara Associated Students Coastal Fund Gala.

2021 **Water Resources Research Center and 'Ike Wai Seminar Series**, University of Hawai'i at Mānoa. "The Ala Wai Watershed from nutrients to microbes." Bullington, J. A. and Mahaffey, S. (link)

2020 **Ocean Sciences Meeting**, Session CP006: Human Populations and Influences in the Coastal Zone: Effects on Ocean and Human Health (OHH)
"Biological-physical modeling to predict the dynamics of a pathogenic bacterium, *Vibrio vulnificus*, in an urbanized estuary in Hawai'i." Bullington, J. A., Steward, G. F., McManus, M. A., Neuheimer, A. B., Glazer, B. T., Nigro, O. D., Powell, B. S., and Nelson, C. E.

2020 **Conference of the Biological Oceanography Graduate Students**, University of Hawai'i "Biological-physical modeling to predict the dynamics of a pathogenic bacterium, *Vibrio vulnificus*, in the Ala Wai Canal." Bullington, J. A., Golder, A., Steward, G. F., McManus, M. A., Neuheimer, A. B., Glazer, B. T., Nigro, O. D., Powell, B. S., and Nelson, C. E.

2019 **Monterey Bay Aquarium Research Institute Intern Symposium**
"Digging into DNA: Evaluating propidium monoazide as a tool to remove nonviable microbial DNA from deep-sea sediment cores." Bullington, J. A., Sudek, S., and Worden, A.

2019 **University of Hawai'i Sea Grant Symposium**
"Biological-physical modeling of the distribution of a pathogenic bacterium, *Vibrio vulnificus*, in the Ala Wai Canal." Bullington, J. A., Steward, G. F., McManus, M. A., Neuheimer, A. B., Glazer, B. T., and Nelson, C. E.

2019 **Tester Memorial Symposium for Ocean Science**, University of Hawai'i at Mānoa
"Septicemia and the sea: Modeling the distribution of a pathogenic bacterium, *Vibrio vulnificus*, in the Ala Wai Canal." Bullington, J. A., Steward, G. F., McManus, M. A.,

Neuheimer, A. B., Glazer, B. T., and Nelson, C. E.

2019 **Hanauma Bay Educational Lecture Series**, University of Hawai‘i at Mānoa
“Life in the Ala Wai Canal: Predicting the risk of exposure to a harmful pathogen.” Bullington, J. A., Steward, G. F., McManus, M. A., Neuheimer, A. B., Glazer, B. T., and Nelson, C. E.

2018 **Hanauma Bay Educational Lecture Series**, University of Hawai‘i at Mānoa
“Water quality in a changing world: Biophysical modeling of *Vibrio vulnificus* pathogen risk in the Ala Wai Canal.” Bullington, J. A., Steward, G. F., McManus, M. A., Neuheimer, A. B., Glazer, B. T., and Nelson, C. E.

2017 **Associated Students Coastal Fund Gala**, University of California, Santa Barbara
“Coastal nutrient dynamics in the context of the 2015 Refugio State Beach oil spill in the Santa Barbara Channel.” Bullington, J. A., Ladd, T. L., Wear, E. K., Carlson, C. A., and Iglesias-Rodríguez, M. D.

2017 **Worster Award Symposium**, University of California, Santa Barbara
“The effects of the Refugio oil spill on phytoplankton in the Santa Barbara Channel.” Ladd, T. M., Bullington, J. A., and Iglesias-Rodríguez, M. D.

2017 **Anacapa School Breakfast Club on Ocean Health**
“Taking action through research: microbes as bioremediation to oil spill pollution.” Bullington, J. A. and Iglesias-Rodríguez, M. D.

2016 **North Pacific Marine Science Organization**
Pacific International Council for the Exploration of the Sea Meeting
“Physiological responses of marine phytoplankton to oil exposure: Santa Barbara Channel, 2015.” Ladd, T. M., Bullington, J. A., Matson, P. G., Kudela, R. M., and Iglesias-Rodríguez, M. D.

2016 **Undergraduate Research Slam**, University of California
“The spill issue: Effects of oil exposure on phytoplankton of the Santa Barbara Channel.” Bullington, J. A., Ladd, T. L., and Iglesias-Rodríguez, M. D.

2015 **Summer Undergraduate Research Fellowship**, University of California
“Are gametes well suited for environmental changes? Sensitivity of the dinoflagellate *Lingulodinium polyedrum* to climatic stressors.” Bullington, J. A. and Iglesias-Rodríguez, M. D.

2015 **Undergraduate Research & Creative Activities**, University of California
“Are gametes more robust than asexual cells? Sensitivity of the dinoflagellate *Lingulodinium polyedrum* to climatic stressors.” Bullington, J. A. and Iglesias-Rodríguez, M. D.

HONORS AND AWARDS

2021 – present **Research, Action, and Impact through Strategic Engagement (RAISE) Doctoral Fellowship**, Stanford University. “Supports doctoral students who are motivated to make positive contributions to their communities and the world through their research and scholarship... to accelerate our purposeful impact in the world.”

2021 – present **Stanford Graduate Fellowship (SGF) in Science and Engineering**, ARCO Fellow, Stanford University. "Stipend and tuition support to outstanding students pursuing doctoral degrees in science and engineering."

2018 – 2020 **University of Hawai'i Sea Grant Fellowship**, Graduate Research Assistantship
"Enabling real-time predictive modeling of microbial pathogen risk along the Honolulu shoreline." (link)

2020 **Diversity Merit Based Award**, UH Graduate Student Organization $5,000
"To recognize outstanding graduate student work related to diversity or diverse populations."

2020 **J. Watumull Merit Scholarship**, University of Hawai'i at Mānoa $2,000
"For outstanding scholastic achievement and a desire to improve oneself and their profession." (link)

2020 **Honorable Mention**, NSF - Graduate Research Fellowship Program (GRFP)
Geosciences - Biological Oceanography, Sweeping "Excellent" Reviews (link)

2017 **Honorable Mention**, NSF - Graduate Research Fellowship Program (GRFP)
Geosciences - Biological Oceanography, "Excellent" and "Very Good" Reviews

2014 – 2017 **Bentson Scholars Fellowship**, University of California, Santa Barbara $15,000
"A merit-based initiative for undergraduates with an interest in aquatic biology."

2016 **Worster Research Fellowship**, University of California, Santa Barbara $5,000
"Financial support for exceptional research in collaboration with a graduate student."

2016 **Alumni Scholarship**, University of California, Santa Barbara $2,000
"For a strong academic record and financial need."

2016 **Undergraduate Research Award**, UC Education Abroad Program $1,000
"To recognize undergraduate students who have conducted exceptional research while studying abroad."

2016 **Associated Students Coastal Fund Internship**, University of California $700
"To assist research funded by the Associated Students Coastal Fund."

2015 **Promise Award**, UC Education Abroad Program $2,000
"Based on academic merit and integration of a selected UCEAP program into a student's academic and career goals."

2014 **Isabella-Price Scholarship**, University of California, Santa Barbara $2,000
"Demonstrated academic excellence and financial need."

2013 **Leadership Award**, UC Summer Institute of Mathematics and Science $400
"Recognized for exceptional leadership abilities during the SIMS internship."

2015 **Sea of Tomorrow Scholarship**, Beneath the Sea Foundation $1,000
"For training in a diving related program."

2013 **May Gong-Tenney Youth Scholarship**, Monterey Audubon Society $1,000

"For an award-winning essay on the importance of environmental conservation."

2010 **Lori and Lou Flagg Scholarship** $1,000
"Awarded for highest academic achievement and career potential."

CERTIFICATIONS

2020 Deep Diver - Professional Association of Diving Instructors
2019 Boat Operator - Hawai‘i Institute of Marine Biology Boating Operations
2018 Boat Operator - BoatUS Training
2015 Scientific Diver - American Academy of Underwater Sciences
2015 Rescue Diver - University of California, Santa Barbara
2015 Nitrox Diver - University of California, Santa Barbara
2014 Open Water Diver - SCUBA Schools International