

Abigail G. Keller



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[Google Scholar](#)



<https://github.com/abigailkeller>

Education

- 2022 - Current **PhD, Environmental Science, Policy, and Management**,
University of California Berkeley
Advisors: Dr. Carl Boettiger and Dr. Perry de Valpine
- 2019 – 2021 **Master of Marine Affairs**, University of Washington
Thesis: Finding the Practical Value of Environmental DNA Data: A
Case Study with *Carcinus maenas*
Advisor: Dr. Ryan Kelly
- 2013 – 2017 **BS, Biology**, Haverford College
Thesis: Characterizing the culturable surface microbiomes of
diverse marine animals
Advisor: Dr. Kristen Whalen

Grants and Awards

Grants and Fellowships

- 2023 - 2027 Computational Science Graduate Fellowship. **Department of Energy**.
(\$180,000)
- 2022 - 2025 A decision framework for managing European Green Crab infestations on
the coast of Washington and Salish Sea shorelines. **US Geological
Survey**. UCB Award ID: 054356-001. (\$174,577)
- 2023, 2024 Summer Research Funding Grant. **UC Berkeley**. (\$2000, \$1700)
- 2023, 2024 Lyman Wildlife Fund. **UC Berkeley**. (\$1500, \$1700)
- 2023 Predictive Ecology Early Career Award. **Gordon Research Conference**
(\$500)

Awards

- 2021 McKernan Award for Most Outstanding Thesis, University of Washington
- 2017 Irving Finger Prize in Biology, Haverford College
- 2014 - 2016 NCAA Centennial Athletic Conference Academic Honor Roll, Haverford
College

Publications

Peer-Reviewed Journal Articles

9. Goldstein, B.R., **Keller, A.G.**, Calhoun, K.L., Barker, K.J., Montealegre-Mora, F., Serota, M.W., Van Scoyoc, A., Parker-Shames, P., Androzzi, C., de Valpine, P. How do ecologists estimate occupancy in practice? (Accepted). *Ecography*.
8. Betters, M., Stabbins, A., **Keller, A.G.**, Cordes, E.E. (2023) Biogeography and depth partitioning in deep-sea gastropods at the Pacific Costa Rica Margin. *Journal of Biogeography*. 50(12), 2109-2121. <https://doi.org/10.1111/jbi.14722>
7. Montealegre-Mora, F., Chapman, M., **Keller, A.G.**, Lapeyrolerie, M., Boettiger, C. (2023). Pretty darn good control: when are approximate solutions better than approximate models? *Bulletin of Mathematical Biology*. 85, 95. <https://doi.org/10.1007/s11538-023-01198-5>
6. **Keller, A.G.**, Dahlhoff, E.P., Bracewell, R., Chatla, K., Bachtrog, D., Rank, N.E., Williams, CM. (2023). Multi-locus genomic signatures of local adaptation to snow across the landscape in California populations of the willow leaf beetle. *Proceedings of the Royal Society B: Biological Sciences*. 290(2005). <https://doi.org/10.1098/rspb.2023.0630>
5. **Keller, A.G.**, Grason, E. McDonald, P.S., Ramón-Laca, A., Kelly, R.P. (2022). Tracking an invasion front with environmental DNA. *Ecological Applications*. e2561. <https://doi.org/10.1002/eap.2561>
4. Jacobs-Palmer, E., Gallego, R., Cribari, K., **Keller A.G.**, Kelly, R.P. (2021). Environmental DNA Metabarcoding for Simultaneous Monitoring and Ecological Assessment of Many Harmful Algal Bloom Taxa. *Frontiers in Ecology and Evolution*. 9: 612107. <https://doi.org/10.3389/fevo.2021.612107>
3. **Keller, A.G.**, Apprill, A., Lebaron, P., Robbins, J., Romano, T., Overton, E., Yuan, R., Rong, Y., Pollara, S., Whalen, K. (2021). Characterizing the culturable surface microbiomes of diverse marine animals. *FEMS Microbiology Ecology*. 97, fiab040. <https://doi.org/10.1093/femsec/fiab040>
2. Goffredi, S.K., Tilic, E., Mullin, S.W., Dawson, K.S., **Keller, A.G.**, Lee, R.W., Wu, F., Levin, L.A., Rouse, G., Cordes, E.E., Orphan, V.J. (2020). Methanotrophic bacterial symbionts fuel dense populations of deep-sea feather duster worms (*Sabellida*, *Annelida*) and extend the spatial influence of methane seepage. *Science Advances*. 6: eaay8562. <https://doi.org/10.1126/sciadv.aay8562>
1. Auscavitch, S.R., Deere, M.C., **Keller, A.G.**, Rotjan, R.D., Shank, T.M., Cordes, E.E. (2020). Oceanographic Drivers of Deep-Sea Coral Species Distribution and Community

Assembly on Seamounts, Islands, Atolls, and Reefs Within the Phoenix Islands Protected Area. *Frontiers in Marine Science*. 7:42. <https://doi.org/10.3389/fmars.2020.00042>

In Review or Submitted

Acharya-Patel, N., Cram, K., Groenwold, E.T., Lee, H. **Keller, A.G.**, Bomback, B., Lyons, S., Warren, R.L., Coombe, L. Lowe, C., Bergman, L.C., Bishay, F., Birol, I., MacDonald, T.A., Helbing, C.C. Monitoring marine pollution effects through targeted environmental DNA (eDNA) testing in the Pacific Northwest. (In Review). *Marine Pollution Bulletin*.

Keller, A.G. and Kelly, R.P. eDNAjoint: an R package for interpreting paired or semi-paired environmental DNA and traditional survey data in a Bayesian framework. (In Review) *Methods in Ecology and Evolution*.

Keller, A.G., Counihan, T.D., Grosholz, E.D., Boettiger, C. The transition from resistance to acceptance: managing a marine invasive species in a changing world. (In Review) *Journal of Applied Ecology*.

Software and Management Tools

eDNAjoint: R package useful for interpreting observations from paired eDNA and traditional surveys. Peer-reviewed through *ROpenSci*, silver statistical software badge. [User guide](#).

European Green Crab Management Tools: Washington Sea Grant-hosted RShiny app co-developed with invasive species managers throughout Washington State to help plan and interpret European green crab removal efforts.

- Uses R package [greencrab.toolkit](#) (available on Cran)

Research Experience

2022 - 2023 **Graduate Student Researcher, Boettiger Lab, UC Berkeley**
Integrated state-space population models and decision theoretic methods to inform optimal invasive species management strategies

2021 – 2023 **Research Scientist 1, University of Washington/Washington Sea Grant**
Developed an interactive web tool (RShiny application) to support invasive species managers in planning and interpreting environmental DNA (eDNA) and trapping surveys

- 2021 – 2022 **Lab Manager, Williams Lab, UC Berkeley**
Conducted landscape genomic analyses to characterize environmental conditions contributing to adaptive genetic variation in California’s willow leaf beetle
- 2020 – 2021 **Graduate Research Assistant, University of Washington/Washington Sea Grant**
Built a Bayesian statistical model to aid eDNA data interpretation and inform use in invasive species management practices
- 2017 – 2019 **Research Assistant/Lab Manager, Cordes Lab, Temple University**
Used deep-sea remotely operated vehicle (ROV) and autonomous underwater vehicle (AUV) data to build habitat suitability models of deep-sea invertebrates with GIS and maximum entropy modeling methods
- 2016 – 2017 **Undergraduate Research Assistant, Whalen Lab, Haverford College**
Characterized the culturable microbiomes from the surfaces of marine animals and applied multivariate statistical analyses to find trends in microbial diversity
- 2016 **Guest Student, Apprill Lab, Woods Hole Oceanographic Institution**
Produced a microbial library of isolated bacterial and fungal strains associated with the skin and surface of marine host animals

--- Presentations

Mobilizing Environmental DNA (eDNA) for Management in the Northeast Pacific Ocean Region. 2024. Oral Presentation. Keller, A. *Mobilizing eDNA research for European green crab management: advances and limitations*.

Washington European Green Crab Trappers Summit. 2023. Featured Speaker. Keller, A., McDonald, P.S., Grason, E., Kelly, R.P. *A Shiny App for planning and interpreting European Green Crab trapping efforts*.

The Wildlife Society Annual Meeting. 2023. Oral Presentation. Keller, A., Counihan, T., Boettiger, C. *The transition from resistance to acceptance: controlling a marine invasive species in a changing world*.

North Pacific Marine Science Organization (PICES) Annual Meeting. 2023. Oral Presentation. Keller, A., Counihan, T., Boettiger, C. *The transition from resistance to acceptance: controlling a marine invasive species in a changing world*.

Predictive Ecology Gordon Research Conference (GRC). 2023. Poster presentation. Keller, A. de Valpine, P., Boettiger, C. *Developing a decision support framework for managing a marine invasive species under uncertainty*.

California Conservation Genomics Project. 2022. Oral presentation. Keller A., Dahlhoff, E., Bracewell, R., Chatla, K., Bachtrog, D., Rank, N., Williams, C. *Multilocus genomic signatures of local adaptation to snow in the willow leaf beetle (Chrysomela aeneicollis)*.

Salish Sea Ecosystem Conference. 2022. Snapshot video. Keller A., Grason, E., McDonald, P.S., Kelly, R. *An interactive web tool for planning and interpreting European green crab management efforts*.

Pacific Coast Shellfish Growers Association. Virtual. 2021. Oral Presentation. Keller, A. *The Practical Value of eDNA Information: A Case Study with European Green Crab*.

Development of eDNA Research. Virtual. 2021. Oral Presentation. Keller, A., Kelly, R. *Tracking a Marine Invasion Front Using Molecular Surveys*.

Association for the Sciences of Limnology and Oceanography. San Juan, PR. 2019. Oral Presentation. Keller, A., Durkin, A., Cordes, E. *Cold seep habitat mapping of Costa Rica's Pacific continental margin*.

Association for the Sciences of Limnology and Oceanography. Honolulu, HI. 2017. Poster Presentation. Keller, A., Apprill, A., Lebaron, P., Robbins, J., Whalen, K. *Isolating diverse microorganisms via targeted cultivation of marine animal microbiomes*.

PennCHOP Microbiome Symposium. Philadelphia, PA. 2016. Poster Presentation. Keller, A., Apprill, A., Lebaron, P., Robbins, J., Whalen, K. *Isolating diverse microorganisms via targeted cultivation of marine animal microbiomes*.

WHOI Summer Student Research Symposium. Woods Hole, MA. 2016. Poster Presentation. Keller, A., Apprill, A., Lebaron, P., Robbins, J., Whalen, K. *Isolating diverse microorganisms via targeted cultivation of marine animal microbiomes*.

Teaching Experience

2020	Graduate Teaching Assistant, Analysis for Biologists I, University of Washington Assisted the instruction of a differential calculus course with ecological and biological applications
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- 2019 **Biology 180 Field Trip Leader, University of Washington**
Developed curriculum and led field trips for groups of 10-16 undergraduate students to Washington Park Arboretum to teach about tree evolution and phylogeny
- 2017 **Undergraduate Teaching Assistant, Introduction to Biology, Haverford College**
Assisted the instruction of a cellular and molecular biology laboratory course, graded weekly assignments and laboratory exams

Press

Crosscut: "[New UW research explores a way to fight off invasive green crabs](#)"

University of Washington News: [eDNA a useful tool for early detection of invasive green crab](#)"

KNKX NPR: "[Washington researchers identify new tool in fight to contain invasive green crabs: eDNA](#)"

KCPQ-TV: [KCPQ-TV FOX 13 News](#) (interview)

Professional and University Service

Journal Peer Review: *Ecology Letters*, *Molecular Ecology*, *Management of Biological Invasions*, *FEMS Microbiology Ecology*

Secretary of Environmental Science, Policy, and Management Graduate Student Association (2023-2024)

Managing Editor of [Currents](#): *A Student Blog Exploring the Intersections of Water, People, and the Environment* (2020-2021)

References

Carl Boettiger, PhD
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Ryan Kelly, PhD, JD
Associate Professor
University of Washington
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Kristen Whalen, PhD
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