Abigail G. Keller

agkeller@berkeley.edu
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 - 2025	Summer Research Funding Grant. **UC Berkeley.** ($5000, $2000, $1700)
2023 - 2025	Lyman Wildlife Fund. **UC Berkeley.** ($2000, $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

13. **Keller, A.G.**, Goldstein, B.G., Skare, L., de Valpine, P. An integrated integral projection model (IPM2) to disentangle size-structured harvest and natural mortality. (Accepted). *Journal of Animal Ecology*

12. 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. (2025). *Marine Pollution Bulletin*. 16:118036. https://doi.org/10.1016/j.marpolbul.2025.118036

11. **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. (2025) *Methods in Ecology and Evolution*. 00,1–9. https://doi.org/10.1111/2041-210X.70000

10. **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. (2025) *Journal of Applied Ecology*. https://doi.org/10.1111/1365-2664.14881

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. (2024) How do ecologists estimate occupancy in practice? *Ecography*. e07402. https://doi.org/10.1111/ecog.07402

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.**, Lapeyolerie, 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 and In Prep

Keller, A.G., Kimball-Rhines, C.*, Leng, D.*, McIntosh, T.L.*, Nelson, K.S. Reconciling the potential and pitfalls of deep learning paradigms in social-ecological systems research. (In review). *Ecology and Society*

Keller, A.G., Okamoto, D., Boettiger, C. Uncertainty as an artifact of cultural bias and an impediment to decision making: a case study with the Pacific lamprey. (In prep).

*authors contributed equally

Software and Management Tools

***eDNAjoint*:** R package useful for interpreting observations from paired eDNA and traditional surveys. User guide. Available on Cran and ROpenSci.

***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

2024	**Visiting Researcher, Oak Ridge National Lab, Oak Ridge, TN** Built native brook trout habitat suitability models to inform hydropower siting
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

The Wildlife Society Annual Meeting. *2025*. Oral Presentation. Keller, A., Okamoto, D., Boettiger, C. *Uncertainty as an artifact of cultural bias and an impediment to decision making: A case study with the Pacific lamprey*.

North American Invasive Species Management Association. 2025. Oral Presentation. Keller, A., Counihan, T., Grosholz, E.D., Boettiger, C. *The transition from resistance to acceptance: Managing a marine invasive species in a changing world*. Recording

Ecological Forecasting Initiative. 2025. Oral Presentation. Keller, A., Boettiger, C., de Valpine, P. Counihan, T. *Supporting rational invasive species removal decision-making through community engagement*.

Washington European Green Crab Manager's Symposium. 2025. Oral Presentation. Keller, A., Goldstein, B.G., Skare, L., de Valpine, P. *An integrated population model to evaluate size-structured European green crab population dynamics*.

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
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

Mentorship

2020-2021	Justine Jadallah (Undergraduate, UW)
2021-2022	Mark Lacsamana (Undergraduate, UCB)
2022	Mumin Sabha (Undergraduate, UCB)
2024	Yijin Wang (Undergraduate, UCB)

Press

ROpenSci: eDNAjoint: a Modeling Tool for Environmental DNA Data

Berkeley Rausser College of Natural Resources: Balancing action and acceptance amidst rapid environmental change

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*, *Ecological Modelling*, *Frontiers in Ecology and Evolution*, *Molecular Ecology*, *Management of Biological Invasions*, *FEMS Microbiology Ecology*

Secretary of Environmental Science, Policy, and Management (ESPM) Graduate Student Association (2023-2024), ESPM 10-year review graduate liaison (2024-2025), ESPM Graduate Programs Committee representative (2024-2025), ESPM Admissions Committee (2024-2025)

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

References

Carl Boettiger, PhD
Associate Professor
UC Berkeley
cboettig@berkeley.edu

Ryan Kelly, PhD, JD
Associate Professor
University of Washington
rpkelly@uw.edu

Kristen Whalen, PhD
Assistant Professor
Haverford College
kwhalen1@haverford.edu