Abigail G. Keller

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Google Scholar
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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.**, 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 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

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 (UW)
2021-2022	Mark Lacsamana (UCB)
2022	Mumin Sabha (UCB)
2024	Yijin Wang (UCB)

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