

Erin Murphy, Ph.D.

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EDUCATION

Arizona State University – Ph.D. Biology, May 2023, 4.0 GPA

Dissertation: Mitigating marine plastic pollution: environmental, economic, and social dimensions. *Committee co-chairs: Leah Gerber & Dr. Beth Polidoro*

University of Illinois Urbana-Champaign – M.Sc. Geology, May 2015, 4.0 GPA

Thesis: Quantitative tracking of the cellular and skeletal response of the coral *Orbicella annularis* to gradients in marine sewage pollution. *Advised by Dr. Bruce Fouke*

University of Illinois Urbana-Champaign – B.S. Integrative Biology, May 2013, 3.97 GPA

RESEARCH EXPERIENCE

Post-Doctoral Researcher, Ocean Conservancy & University of Toronto 2023 – Present

- Research the wildlife impacts of marine plastic pollution and benefits of clean-up events
- Serve as a plastic pollution expert on cross-organizational collaborations
- Develop scientific publications and public facing resources

Program Lead for Pollution and Environmental Policy, CBO, ASU 2023 – Present

- Lead research efforts on upstream interventions for plastic pollution
- Collaborate on research in coastal water quality management in marine protected areas
- Support center-wide grants and research initiatives

Consultant, Polidoro Lab, ASU 2023 - Present

- Providing American Samoa with recommendations for a marine debris action plan
- Conducting stakeholder interviews and managing undergraduate marine debris beach surveys

Ph.D. research, Conservation Innovation Lab, ASU 2018 – 2023

- Research the social, ecological, and economic impacts of plastic pollution and interventions

Research Assistant, Bayer and Center for Biodiversity Outcomes, ASU 2020 – 2021

- Evaluated approaches to improve the EPA's methodology for biological evaluations of pesticides

Member of the Plastic Pollution Emission Working Group, SESYNC 2018 - 2020

- Assisted with developing global scenarios for future plastic emissions and manuscript prep

Research Assistant, Center for Biodiversity Outcomes, ASU 2019

- Evaluated fishery certification schemes for their effectiveness in protecting ecosystem services
- Acted as interim project manager and supported grant writing for the center

ORISE Fellow, Office of Water Oceans Watersheds, EPA 2016 – 2018

- Worked in the Ocean and Coastal Management Branch on the vessels team and the coral team
- Conducted policy analyses of pollutant standards and developed communications resources

Research Assistant, Afterschool Alliance 2015 – 2016

- Supported the STEM education and research teams to improve afterschool education

Master's Thesis Research, Dr. Bruce Fouke Lab, University of Illinois 2013 – 2015

- Studied the impacts of human sewage pollution on *O. annularis* physiology and skeletal growth

TEACHING EXPERIENCE

- Adjunct Faculty, Marine Biology, Estrella Mountain Community College, F22; Su22; F21
- Teaching Assistant, Environmental Ethics, Arizona State University, Su22; S22; F21

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- Teaching Assistant, Why People Steal, Cheat and Lie, Arizona State University, Su21
- Teaching Assistant, Why Sex, Arizona State University, Su20
- Teaching Assistant, Bioethics, Arizona State University, S20
- Teaching Assistant, Introductory Biology Lab, Arizona State University, F18; S19; F19
- Teaching Assistant, History of the Earth System, University of Illinois, F14; S15
- Teaching Assistant, Biocomplexity, University of Illinois, F14

PUBLICATIONS

- Murphy, E. L.,** Fredette-Roman, C., Rochman, C., Gerber, L. R., Polidoro, B. (2023) A multi-taxonomic, trait-based framework for assessing macroplastic vulnerability. *Science of the Total Environment*.
- Murphy, E. L.,** Polidoro, B., Gerber, L. R. (2022) The Plastic-scape: Insights from seascape ecology as framework for researching and mitigating marine plastic pollution *Frontiers in Marine Science*.
- Murphy, E. L.,** Iacona, G., Bernard, M., Barnes, M., McGivern, A., & Gerber, L. R. (2022) A decision framework for estimating the cost of marine plastic pollution interventions. *Conservation Biology*. [conbio.onlinelibrary.wiley.com/doi/10.1111/cobi.13827](https://doi.org/10.1111/cobi.13827)
- Helm, L., **Murphy, E. L.,** McGivern, A., Borrelle, S. B. (2022) Impacts of plastic pollution mitigation strategies. *Environmental Reviews*. <https://doi.org/10.1139/er-2021-0117>
- Murphy, E. L.,** Eikenberry, S., Iacona, G, Watson, G, & Gerber, L. R. (2021) The value of increased spatial resolution of pesticide usage data for assessing risk to endangered species. *Conservation Science and Practice*. [conbio.onlinelibrary.wiley.com/doi/epdf/10.1111/csp2.551](https://doi.org/10.1111/csp2.551)
- Murphy, E. L.,** Bernard, M., Gerber, L. R., & K. Dooley. (2021) Evaluating the role of market-based instruments in protecting marine ecosystem services in wild-caught fisheries. *Ecosystem services*. [sciencedirect.com/science/article/pii/S2212041621001145](https://doi.org/10.1016/j.ecoser.2021.1001145)
- Cramer, K. L., Bernard, M. L., Bernat, I., Gutierrez, L., **Murphy, E. L.,** Sangolquí, P, Surrey, K., Gerber, L. R. (2021). The present and future status of ecosystem services for coral reef. *Imperiled: The Encyclopedia of Conservation*.
- Kittinger, J., Bernard, M., Finkbeiner, E., **Murphy, E.,** Obregon, P. Klinger, D. H., Schoon, M. L., Dooley, K. J., & Gerber, L. R. (2021) Integrating market incentives and governance improvements for sustainable ocean production at the ecosystem scale. *Conservation Science and Practice*. [conbio.onlinelibrary.wiley.com/doi/full/10.1111/csp2.386](https://doi.org/10.1111/csp2.386)
- Murphy, E. L.,** Bernard, M., Helm, L., Hill, I & Tunas-Corzon, A. (2020) Policy Recommendations to reinvigorate recycling in Arizona. *The Journal of Science Policy & Governance*. [sciencepolicyjournal.org/article_1038126_jspg170115.html](https://doi.org/10.1080/23746655.2020.1811115)
- Borrelle, S. B., Ringma, J., Law, K. L., Mannahan, C. C., Lebreton, L., McGivern, A., **Murphy E.,** Jambeck, J., Leonard, G. H., Hilleary, M. A., Eriksen, M., Possingham, H. P., Gerber, L. R., Polidoro, B., Tahir, A., Bernard, M., De Frond, H., Mallos, N., Barnes, M., & Rockman C. M. (2020) Predicted growth in plastic waste exceeds efforts to mitigate marine plastic pollution. *Science*. [science.org/doi/abs/10.1126/science.aba3656](https://doi.org/10.1126/science.aba3656)
- Plastic Pollution Emissions Working Group. Evaluating the impact of mitigation strategies for marine litter and microplastics to inform policy: A white paper. (2018). https://docs.wixstatic.com/ugd/0e7900_c5645ab3497f489f92e7330f1fe48ce3.pdf
- Murphy, E. L.,** Gerber, L. R., Rochman, C., Polidoro, B. (In review). A macroplastic vulnerability index for marine mammals, birds, and turtles in Hawai'i. *Conservation Biology*.
- Eikenberry, S., Iacona, G., **Murphy, E. L.,** Watson, G., Gerber, L. R. (In review) Identifying immediate

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opportunities for high resolution pesticide usage data to improve the efficiency of endangered species pesticide risk assessment. *Proceedings in the National Academy of Science*.

Fredette-Roman, C., **Murphy, E. L.** Rolsky, C., Minter, B., Polidoro, B. (In prep). A global vulnerability index for marine mammals to macroplastic ingestion and entanglement. *Science of the Total Environment*.

PRESENTATIONS

Murphy, E. L., Fredette-Roman, C., Polidoro, B. A relative trait-based vulnerability ranking of the world's marine mammals to plastic ingestion and entanglement. International Marine Debris Conference. Bhusan, South Korea. 2022.

Murphy, E. L., Fredette-Roman, C., Rochman, C., Gerber, L. R., Polidoro, B. Ranking the relative vulnerability of Hawai'ian Species to marine macroplastic. North American Congress for Conservation Biology. Reno, NV. 2022.

Ahumada, J., Cheng, S., **Murphy, E. L.** Interactive tools can drive evidence-informed decisions in conservation: insights from camera trap surveys in the Amazon. Association for tropical biology and conservation. Cartagena de Indias, Colombia. 2022.

Murphy, E. L., Fredette-Roman, C., Rochman, C., Gerber, L. R., Polidoro, B. Assessing the relative vulnerability of marine biodiversity to macroplastics. Association for the Sciences of Limnology and Oceanography's Ocean Sciences Meeting. Honolulu, HI. 2022.

Murphy, E. L., Eikenberry, S., Iacona, G., Watson, G. The value of increased spatial resolution of pesticide usage data for assessing risk to endangered species. Society for Environmental Toxicology and Chemistry annual conference. Portland, OR. 2021.

Murphy, E. L., Bernard, M., Iacona, G., Borrelle, S. B., Barnes, M., McGivern, A., Emmanuel, J., Gerber, L. R. A decision framework for estimating the cost of marine plastic pollution intervention. Society for Conservation Biology's Emerging Issues in Conservation Seminar. Virtual. 2021. <https://vimeo.com/638724724>

Murphy, E., Bernard, M., Gerber, L., Dooley, K. Evaluating the role of market-based instruments in protecting marine ecosystem services in wild-caught fisheries. North American Congress for Conservation Biology. Denver, Colorado. 2020.

Barnes, M., Iacona, G., Bernard, M., Gerber, L., **Murphy, E.** Costs of mitigating marine plastic pollution: a decision support tool. International Congress for Conservation Biology., Kuala Lumpur, Malaysia. 2019.

Watts-Fitzgerald, K., **Murphy, E.** EPA's Vessel Sewage Program. SOBA Annual Conference. Anchorage, AK. 2017.

Grant, J., Braithwaite, M., Dvorak, M., **Murphy, E. L.** Juvenile Justice. 21st Century Community Learning Centers (21st CCLC) 2016 Summer Institute. Phoenix, AZ. 2016.

POSTERS

Murphy, E. L., Borrelle, S., Kittinger, J., Gerber, L. R. Engaging stakeholders in identifying scenarios to mitigate marine plastic pollution in Hawai'i. American Geophysical Union. Chicago, IL. 2022.

Murphy, E. L., Barnes, M., Iacona, G., Bernard, M., Gerber, L. R., McGivern, A., Borrelle, S. The cost of mitigating marine plastic pollution. Institute for Social Science Research. Tempe, AZ. 2020.

Murphy, E. L., Barnes, M., Iacona, G., Bernard, M., Gerber, L. R., McGivern, A., Borrelle, S. The cost of mitigating marine plastic pollution. Society for Environmental Toxicology and Chemistry annual conference. Toronto, Canada. 2019.

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Murphy, E. L., Sivaguru, M., Fouke, F. W. Physiological Response of the Caribbean Coral *O. annularis* to Pollution Gradients. Midwest Geobiology Conference. 2014.

Murphy, E. L., M. Sivaguru, B. W. Fouke. Physiological Response of the Caribbean Coral *O. annularis* to Pollution Gradients. American Geophysical Union. 2014.

MEDIA

CM. 2023. Arizona lawmakers want to restore recycling fund. But environmentalists fear one addition. <https://www.azcentral.com/story/news/local/arizona-environment/2023/05/03/arizona-lawmakers-consider-plan-to-fund-plastic-to-fuel-plants/70147952007/>

EM, LH. 2021. Lawmakers raided funds meant for recycling, raising fees, or scaling back programs. AZ Central. [azcentral.com/story/opinion/op-ed/2021/02/05/arizona-recycling-fund-raided-lawmakers-hurt-programs/4377908001/](https://www.azcentral.com/story/opinion/op-ed/2021/02/05/arizona-recycling-fund-raided-lawmakers-hurt-programs/4377908001/)

AB, HKF, AZ, **EM.** 2020. Wellness Privacy, Recycling, & Commercialization of the Arctic [SciPol SoundBites - S3 | E6. *Journal of Science Policy and Governance*. [youtube.com/watch?v=7vBIGQ2VPIs](https://www.youtube.com/watch?v=7vBIGQ2VPIs)

EM, MB, IH, ATC, LH. 2020. Arizona should take steps to reinvigorate recycling. Arizona Capitol Times. [scecu.org/arizona-should-take-steps-to-reinvigorate-recycling-arizona-capitol-times/](https://www.scecu.org/arizona-should-take-steps-to-reinvigorate-recycling-arizona-capitol-times/)

NG. 2020. Study: Massive Global Effort Needed to Reduce Plastic Pollution By 2030. NPR KJZZ. [Fronterasdesk.org/content/1621612/study-massive-global-effort-needed-reduce-plastic-pollution-2030](https://www.fronterasdesk.org/content/1621612/study-massive-global-effort-needed-reduce-plastic-pollution-2030)

SKILLS & CERTIFICATIONS

AAUS Scientific Diver	Microsoft products
PADI Rescue & Nitrox Diver	R
Project Management	ArcGIS

LEADERSHIP AND SERVICE

<i>2020 – Present</i> Arizona Recycling Coalition Exec. Board, Policy Chair 2021-2022 Long-term steering committee, 2023	<i>2020 – Present</i> AZ Forward Plastics Committee Lead 2022 Circular Economy Committee Member
<i>2020 – Present</i> The Circulate Initiative Impact Metrics Working Group	<i>2021 - 2022</i> Keep Tempe Beautiful Executive Board Member
<i>2019 – 2023</i> Arizona Science Policy Network Executive Board Co-Chair, 2021-2023 Waste Management Committee Chair 2020	<i>2019 – 2022</i> SOLS Executive Board Sustainability Rep 2020 – 2022 Strategic Planning Rep 2019 – 2020
<i>2019 – 2022</i> SOLS Sustainability Committee President 2020 – 2022 Co-founder, Vice President 2019 – 2020	<i>2018 – 2020</i> AZ Women’s Climbing Coalition Tempe Chapter Lead
<i>2018 – 2022</i> Ask a Biologist	<i>2019 – 2020</i> Prison Biology Teaching Project

MENTORSHIP

<i>Master’s students</i>	<i>Undergraduate students</i>
2021-2022 Cassidy Fredette-Roman, thesis support Co-authored publication in press Co-authored publication in review	2023 Cecelia Darter, publication in prep 2021-2022 Kristin Deacon, thesis committee 2021 Victoria Rader, AzRC intern
2019 – 2021 Infynity Hill, thesis support One co-authored publication	2020 Emily Byrum 2020 Katelyn Velez

AWARDS & HONORS

2022 Graduate College Completion Fellowship (\$19,200)

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- 2022 Lisa Dent Memorial Fellowship (\$6,440)
- 2021 Arijit Guha Graduate Student Advocacy Award
- 2020 North American Congress for Conservation Biology Student Presentation Award Finalist
- 2015 Harriet Wallace Outstanding Female Graduate Student
- 2015 Outstanding Graduate Teaching Assistant Award
- 2013 Evergreen Endowed Fellowship in Geology (\$20,000)
- 2013 Bronze Tablet Award (graduated in top 3% of college)
- 2013 Chancellor's Scholar Graduate
- 2013 James' Scholar Graduate

FUNDING

- 2022 ASU Graduate and Professional Student Association Terminal Research Grant (\$2000)
- 2022 Center for Biology and Society Unusual Student Project Funding (\$2000)
- 2022 Center for Biology and Society Student Travel Award (\$1060)
- 2022 ASU Graduate and Professional Student Association Travel Grant (\$950)
- 2022 ASU School of Life Sciences Travel Grant (\$400)
- 2021 ASU Tripke Travel Grant (\$2000)
- 2021 ASU Graduate and Professional Student Association Publication Grant (\$900)
- 2021 ASU Graduate College Travel Award (\$300)
- 2019 ASU School of Life Sciences Travel Grant (\$400)
- 2019 ASU Graduate and Professional Student Association Travel Grant (\$950)
- 2014 Lerner Gray Memorial Fund, AMNH (\$1400)
- 2014 AAPG-GIA, Edward C. and Caroline Beaumont Named Grant (\$1500)
- 2014 Sohl Research Award, UIUC Geology Department (\$2,843)
- 2013 UIUC Graduate College travel grant (\$500)

OUTREACH

- 2023 Plenary speaker for The Sustainability Consortium Annual Conference
- 2022 Guest speaker for Wells Fargo Sustainability Team
- 2022 Guest speaker at Arizona State Prison Complex
- 2021 Bi-annual guest lecturer at California State University, Chico
- 2021 Annual WE Empower UN SDG Challenge judge
- 2021 ASU Sustainability Challenge Pitch Day judge
- 2021 Guest speaker at Chaparral High School
- 2020 Bi-annual guest lecturer at California State University, Chicgo
- 2020 WE Empower UN SDG Challenge judge
- 2019 ASU Open Door
- 2019 OdySEA Aquarium Conservation Expo

EDITORIAL ACTIVITIES

- 2021 Peer reviewer for Conservation Biology
- 2021 Peer reviewer for the International Journal of the Commons
- 2020 Peer reviewer for Plos One