



Evaluation of the Final Environmental Impact Assessment Report
Multi-commodity Prospecting Activities in Marine Concessions 11A, 12A,
13A, 11B, 12B and 13B, West Coast, South Africa

Impacts to Fisheries

By Dr. Megan Egler and Dr. Bree Yednock

Environmental Law Alliance Worldwide

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Context

This report analyzes the Final Environmental Impact Assessment (EIA) Report: Multi-commodity Prospecting Activities in Marine Concessions 11A, 12A, 13A, 11B, 12B and 13B, West Coast, South Africa with emphasis on its associated Fishery Impact Assessment (FIA; i.e., Appendix C2) with the aim of evaluating two specific aspects (see points 1 and 2 below) regarding the accuracy with which impacts to fisheries and fishing communities have been assessed in response to the Biodiversity Law Centre's request to ELAW to provide expert scientific and technical input. In short, we find that the EIA and FIA fail to realistically capture the expected impacts of the proposed project to fisheries and fishing communities.

Dr. Bree Yednock joined ELAW in 2024, bringing experience in marine and coastal ecosystem assessment, research, and protection. She managed the South Slough National Estuarine Research Reserve on the southern Oregon Coast, where she worked on habitat conservation, biodiversity assessment and research and monitoring of climate impacts on the coastal environment. Bree holds a doctorate in environmental and evolutionary biology from University of Louisiana, a master's in coastal, marine, and wetland studies from Coastal Carolina University, and a bachelor's in environmental studies from University of Oregon. She has testified before Oregon's legislature and worked closely with attorneys on legislative reform. She has nearly 30 years of professional and research experience in environmental science, ecology, and biology, during which she has conducted peer-reviewed research, field and laboratory studies, watershed and wetland restoration project assessments, and policy analyses governing ecological systems.

Dr. Megan Egler joined ELAW in 2025 bringing experience in ecological economics. Megan earned a Ph.D. in natural resources from the University of Vermont with a specialization in ecological economics, and a master's in food, agriculture, and resource economics from the University of Guelph in Ontario, Canada. She has more than a decade of research experience in applied economic analysis, analyzing the economic and social dimensions of development projects, including their impacts on local economies, ecosystem services, livelihoods, and environmental justice. She currently serves as Vice President of the Canadian Society for Ecological Economics and previously served on the Board of the International Society for Ecological Economics.

1: Assessment of impacts to fisheries

The Fishery Impact Assessment (FIA) identifies and considers only three impacts:

- 1) the temporary exclusion of fishing operations resulting from the safety zone around survey and sampling vessels;
- 2) the availability of catch as a result of the discharge of sediment plume and
- 3) changes to catch resulting from increased underwater noise during geophysical surveys.

The FIA does not discuss the longer term impact of habitat impacts from the bulk grab sampling that will remove 400 samples of sediment, each totaling 1.5 m³ and weighing 100 tons (page 23),

creating trenches and pits in the seafloor, the loss of prey when infauna are smothered under discharged tailings, sublethal and lethal effects of increased turbidity on fish (e.g., reduced feeding by predators that rely on sight, slower growth rates from reduced feeding, etc.), reduced primary productivity in plankton communities and knock-on effects to upper-trophic-level fishery species, or the effects of noise and vibrations from drilling, bulk sampling, and vibracoring on fishery species.

2: Assessment of proposed project footprint with respect to fisheries and fishing communities

The EIA provides an unrealistic calculation of the impact and disturbance area based on the exact dimensions of the sampling equipment. Even with these claims, however, the EIA includes statements recognizing that noise levels and sediment plumes will extend beyond the immediate sampling area.

Noise

The Fisheries Impact Assessment (FIA) states on page 98 that *“the sound generated by sampling operations falls within the hearing range of most fish and depending on sea state would be audible for up to 20 km around the vessel before attenuating to below threshold levels.”* This section states sound levels are described as 120-190 dB re 1 μ Pa at the sampling unit, with main frequencies between 3 – 10 Hz, but this is the only time the EIA or any of the specialist reports provide any recognition or estimates of expected sound levels from sampling activities (vibracoring, drilling, or bulk sampling) and impacts from these sound sources are not considered.

The EIA and specialist reports note the sound from the sonar surveys will be audible to fish for distances “in the order of tens of km” - see (FIA) page 86:

“The sound generated by the sub-bottom profiler, which uses shallow (35 to 45 kHz) and medium penetration (1 to 10 kHz) “Chirp” acoustic pulses to generate profiles up to 60 m beneath the seafloor, at sound levels of up to 220 dB re 1 μ Pa at 1 m, falls within the hearing range of most fish and will be audible for considerable distances (in the order of tens of km) before attenuating to below threshold levels.”

This section also states, *“Ambient noise levels in the study area are estimated to be below 80 dB re 1 μ Pa, for the frequency range 10 Hz – 10 kHz (SLR Consulting Australia 2022) with relatively strong metocean conditions and insignificant local shipping traffic.”* (emphasis added) It’s important to note that this is an estimate of ambient noise level and was taken from a study from 2022; therefore, it cannot be assumed to reflect current conditions. Also, the cited study (SLR consulting Australia 2022) is not included in the list of references so it’s not clear how the estimate was derived, although an EIA prepared by SLR Consulting for a proposed project off the coast of Namibia uses the same estimate, for which they reference a generalized review of

noise that was published in 1962.¹ Noise levels in the ocean have increased significantly since 1962 and are considered to be a significant stress for marine life.²

Background on Underwater Noise Pollution

Water is a dense medium, allowing sounds to travel faster and farther under water than through air. A wide diversity of marine life, including fish and invertebrates, have evolved hearing and vocalizations to utilize underwater sound for essential biological functions, such as feeding, breeding, communicating, navigating, and socializing.³ However, the increasing frequency and level of anthropogenic (man-made) noise is changing the natural soundscape of the marine environment and impeding the ability of marine animals to receive and respond to acoustic signals.^{4,5} In addition, anthropogenic sound at high enough levels can cause direct injury to marine organisms resulting in temporary or permanent hearing loss, and even death.^{6,7} When noise impacts change the natural behaviors, movements, feeding, reproduction and survival of marine life, they can extend beyond individuals to populations and communities,^{8,9} as well as impact ecological processes like nutrient cycling.¹⁰

Impacts of Noise Pollution on Marine Fish and Invertebrate Species

While marine invertebrates and most fish species lack hearing organs similar to those of mammals that are necessary for detecting sound pressure, they have a diversity of sensory structures that are highly sensitive to the particle motion of sounds, such as vibrations in the seabed.¹¹ As the name suggests, vibracore sampling produces vibrations that reverberate

¹ Page 7 - SLR Canada, 2026. Underwater Sound Transmission Loss Modelling Study. Environmental and Social Impact Assessment for 3D Seismic Survey in PEL0085/Block 2914A, offshore southern Namibia. , s.l.: SLR Consulting. <https://cdn.sanity.io/files/b0ecix6u/production/7cb04cd9ebd06df6466107e10e6eb5543a17a8c1.pdf>

² Duarte, C. M. et al. (2021). The soundscape of the Anthropocene ocean. *Science*, 371 (eaba4658).

<https://www.science.org/doi/abs/10.1126/science.aba4658>

³ Ibid.

⁴ Popper, A., Hawkins A. & Thomsen, G. (2020). Taking the Animals' Perspective Regarding Anthropogenic Underwater Sound. *Trends in Ecology & Evolution* 35 (9)787-794.

[https://www.cell.com/trends/ecology-evolution/abstract/S0169-5347\(20\)30132-4](https://www.cell.com/trends/ecology-evolution/abstract/S0169-5347(20)30132-4)

⁵ Radford, A. N., Kerridge, E., & Simpson, S. D. (2014). Acoustic communication in a noisy world: can fish compete with anthropogenic noise?. *Behavioral Ecology*, 25(5), 1022-1030. <https://doi.org/10.1093/beheco/aru029>

⁶ Širović, A., Amorim, M. C. P., Baumann-Pickering, S., & Kok, A. C. (2026). Physiological effects of anthropogenic sound on aquatic animals: where are we and what is next?. *Journal of Experimental Biology*, 229(Suppl_1), jeb250800. <https://doi.org/10.1242/jeb.250800>

⁷ Solé M, Kaifu K, Mooney TA, Nedelec SL, Olivier F, Radford AN, Vazzana M, Wale MA, Semmens JM, Simpson SD, Buscaino G, Hawkins A, Aguilar de Soto N, Akamatsu T, Chauvaud L, Day RD, Fitzgibbon Q, McCauley RD and André M (2023) Marine invertebrates and noise. *Front. Mar. Sci.* 10:1129057. doi: 10.3389/fmars.2023.1129057 <https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2023.1129057/full>

⁸ Ibid.

⁹ Duarte, C. M. et al. (2021). The soundscape of the Anthropocene ocean. *Science*, 371 (eaba4658).

<https://www.science.org/doi/abs/10.1126/science.aba4658>

¹⁰ Solan, M., Hauton, C., Godbold, J. A., Wood, C. L., Leighton, T. G., & White, P. (2016). Anthropogenic sources of underwater sound can modify how sediment-dwelling invertebrates mediate ecosystem properties. *Scientific reports*, 6(1), 20540. <https://www.nature.com/articles/srep20540.pdf>

¹¹ Hawkins, A. D., Hazelwood, R. A., Popper, A. N., & Macey, P. C. (2021). Substrate vibrations and their potential effects upon fishes and invertebrates. *The Journal of the Acoustical Society of America*, 149(4), 2782-2790. <https://pubs.aip.org/asa/jasa/article/149/4/2782/1067949>

throughout the sediment and water column, and fish and invertebrates are highly susceptible to these vibrations. Therefore, in addition to describing and considering the impacts on fish and invertebrates of sound pressure (dB re 1 μ Pa-m) and frequency (Hz), it is equally important to describe and understand the particle motion acoustic environment.¹²

Several studies report negative impacts to fish and invertebrates from anthropogenic sounds associated with offshore activities. Studies of fish report these impacts can result in changes in physiology and behaviour, impairment of spawning and predator avoidance, interference with foraging and feeding, disruption of migrations and habitat selection, physical damage, reduced hearing ability, and death.^{13,14,15,16} A recent meta-analysis of data on 50 invertebrate species from 46 studies across 15 countries also concludes that anthropogenic noise and synthetic sounds can have detrimental impacts on aquatic invertebrate behavior and physiology. The authors noted arthropods (e.g. lobsters, shrimp and crabs) and molluscs (e.g. clams and mussels) exhibited pronounced physiological responses to anthropogenic and synthetic noise.¹⁷ Similarly, an expansive and comprehensive review of the literature on impacts of anthropogenic noise on marine invertebrates references studies in which rock lobsters that were exposed to sound levels ranging from 109–185 dB re 1 μ Pa experienced negative impacts on behavior, damage to sensory systems, and physiological stress.¹⁸

Impacts of turbidity on fish: The process of dredging up sediment from the seafloor causes the release of suspended sediments that create plumes of reduced visibility that can extend 10s of kilometers or more, making it harder for fish and invertebrates that rely on visual cues to find food, which can reduce their growth and survival. High levels of suspended sediments can also damage and clog the gills of marine organisms, blocking their uptake of oxygen and leading to suffocation and death.¹⁹ When sediments settle out of the water and onto the seafloor, they can smother and kill organisms living there. Non-mobile, bottom-dwelling species that feed by filtering plankton from the water, such as mussels and clams, are especially vulnerable to

¹² Popper, A. N., and Hawkins, A. D. (2018). The importance of particle motion to fishes and invertebrates. *J. Acoust. Soc. Am.* 143, 470–486; Hawkins, A. D., & Popper, A. N. (2017). A sound approach to assessing the impact of underwater noise on marine fishes and invertebrates. *ICES Journal of Marine Science*, 74(3), 635–651.

¹³ Popper, A. N., & Hawkins, A. D. (2019). An overview of fish bioacoustics and the impacts of anthropogenic sounds on fishes. *Journal of fish biology*, 94(5), 692–713. <https://onlinelibrary.wiley.com/doi/epdf/10.1111/jfb.13948>

¹⁴ Širović, A., Amorim, M. C. P., Baumann-Pickering, S., & Kok, A. C. (2026). Physiological effects of anthropogenic sound on aquatic animals: where are we and what is next?. *Journal of Experimental Biology*, 229(Suppl_1), jeb250800. <https://doi.org/10.1242/jeb.250800>

¹⁵ Duarte, C. M. et al. (2021). The soundscape of the Anthropocene ocean. *Science*, 371 (eaba4658). <https://www.science.org/doi/abs/10.1126/science.aba4658>

¹⁶ Pieniazek, R. H., Beach, R. K., Dycha, G. M., Mickle, M. F., & Higgs, D. M. (2023). Navigating noisy waters: A review of field studies examining anthropogenic noise effects on wild fish. *The Journal of the Acoustical Society of America*, 154(5), 2828–2842. <https://pubs.aip.org/asa/jasa/article/154/5/2828/2920130>

¹⁷ Davies, H. L., Cox, K. D., Murchy, K. A., Shafer, H. M., Looby, A., & Juanes, F. (2024). Marine and Freshwater Sounds Impact Invertebrate Behavior and Physiology: A Meta-Analysis. *Global Change Biology*, 30(11), e17593. <https://onlinelibrary.wiley.com/doi/pdf/10.1111/gcb.17593>

¹⁸ Solé M, Kaifu K, Mooney TA, Nedelec SL, Olivier F, Radford AN, Vazzana M, Wale MA, Semmens JM, Simpson SD, Buscaino G, Hawkins A, Aguilar de Soto N, Akamatsu T, Chauvaud L, Day RD, Fitzgibbon Q, McCauley RD and André M (2023) Marine invertebrates and noise. *Front. Mar. Sci.* 10:1129057. doi: 10.3389/fmars.2023.1129057

<https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2023.1129057/full>

¹⁹ Bruton, M.N. 1985. The effects of suspensoids on fish. *Hydrobiologia* 125: 221–241

increased sedimentation that can overwhelm their filter-feeding mechanisms resulting in starvation.²⁰ Fish eggs and planktonic fish larvae, which are not highly mobile, are also vulnerable to elevated levels of sediment in the water column.

Suspended solids can adversely impact water quality by reducing dissolved oxygen levels in the water, resulting in low-oxygen conditions that can be harmful and lethal to fish and other organisms. This is because suspended sediments are consumed by a microbial community, a process that requires oxygen. When there are more sediments in the water, it fuels bacterial growth and the increased number of bacteria use up more oxygen, making less oxygen available for other organisms.

The cumulative socioeconomic assessment fails to assess the combined effects of past, present and future marine activities on coastal/fishing communities and relies on limited and internally inconsistent evidence to justify the project's socio-economic benefits.

Section 6.3.3, the Cumulative impact Analysis, within Appendix 3 - Social Impact Assessment (SIA) acknowledges that several past and present mining projects in the area have impacted the natural environment, with mention of past diamond mining companies leaving the environment in a “state of despair”. It is also stated that livelihoods of communities adjacent to prospecting and mining concessions are not recipients of positive impacts due to limited employment opportunities and the limited impact of community development projects (page 76, SIA). The SIA goes on to list past and existing activities with potential cumulative impacts in Table 6-16, but does not assess how these activities cumulatively impact the socioeconomic condition of communities in the area. The SIA does not assess whether past and ongoing activities create uncertainty for fishing operations, whether they impact tourism values, or whether repeated disruptions to the natural environment accumulate into longer-term economic impacts. Instead, the SIA deems the cumulative effects of the project “too uncertain to be quantified” (page 73, SIA).

Although the EIA identifies concerning cumulative socio-economic pathways: temporary exclusion from fishing grounds and noise effects on fishing catch rates, it adopts the SIA's assessment and concludes that these impacts are of low significance because simultaneous prospecting activities are unlikely to occur in the same location. This ranking is based on an incomplete assessment of cumulative socio-economic impacts, as it reduces cumulative effects to a question of spatial and temporal overlap between projects rather than assessing the broader cumulative burden experienced by affected communities over time. It does not consider that repeated or consecutive prospecting and mining activities may collectively erode livelihoods, increase uncertainty for fishing operations, reduce confidence in tourism and other marine-based industries, and contribute to ongoing economic insecurity. It also fails to incorporate existing vulnerabilities that are significant to how communities experience and may be impacted by the proposed project. The socioeconomic baseline describes high unemployment in the area, poverty, dependence on fishing, and limited alternative livelihoods. For example, the SIA notes that 90% of households in Doringbaai depend on fishing and other marine resources and that the loss of

²⁰ Berry, W., Rubinstein, N., Melzian, B., & Hill, B. (2003). The biological effects of suspended and bedded sediment (SABS) in aquatic systems: a review. United States Environmental Protection Agency, Duluth, 32(1), 54-55. <https://archive.epa.gov/epa/sites/production/files/2015-10/documents/sediment-appendix1.pdf>

this income is the biggest threat to the community (page 58 of the SIA). Factors like these increase a community's sensitivity to even temporary disruptions to fishing activities. Public participation processes were held within the Scoping Phase (summarized on page 84 of the EIA) and during the Impact Assessment Phase (summarized on page 87 of the EIA). In both phases stakeholders expressed serious concerns about the negative socio-economic effects on local communities, particularly regarding the livelihoods of small-scale fishers, potential harm to tourism, mariculture, and local agriculture. Stakeholders also highlighted adverse effects on their cultural heritage, traditional fishing rights, and spiritual connection to the ocean. Stakeholders explicitly criticized the “inadequate consideration of cumulative impacts from multiple mining and prospecting activities in the region” (page 87, EIA) and had formally requested a Strategic Environmental Assessment (SEA) during the Scoping Phase in order to capture the true regional accumulation of project related impacts over time.

The socio-economic benefits presented in the EIA are limited and, in places, internally inconsistent. The SIA concludes that the proposed prospecting activities will not significantly contribute to employment or economic development opportunities for local communities in the Matzikama Local Municipality, and that communities adjacent to the prospecting areas will not benefit from direct or indirect employment opportunities (Page 56, of the SIA).

Melissa S. Garren

Education

Post-Doctoral Fellowship, Environmental Engineering, MIT (2014); under Prof. Roman Stocker

Ph.D. Marine Biology, Scripps Institution of Oceanography (2011); Advisor: Prof. Farooq Azam

M.S. Marine Biology, Scripps Institution of Oceanography, UCSD (2008)

B.S. Molecular Biology, Yale University (2003)

Languages

Native speaker: English

Professionally competent: French and Spanish

Professional Experience

Marine Scientist 2021-present. Environmental Law Alliance Worldwide. (remote)

Principal & Founder 2020-present. Working Ocean Strategies. (Monterey, CA)

Board Member 2020-present. California Marine Sanctuary Foundation (Monterey, CA)

Center for Blue Economy Advisory Council Member 2019-present. Middlebury's Institute for International Studies, Center for the Blue Economy Advisory Council. (Monterey, CA)

Adjunct Research Faculty 2015-present. California State University Monterey Bay (Seaside, CA)

Review Editor 2015-present. Frontiers in Marine Science

COO & Chief Scientist 2017-2020. [Pelagic Data Systems](#) (San Francisco, CA)

Chief Scientific Officer 2014-2017. [Pelagic Data Systems](#) (San Francisco, CA)

Postdoctoral Researcher 2011-2014. Environmental Engineering, Massachusetts Institute of Technology with Prof. Roman Stocker (Cambridge, MA)

Workshop Organizer 2013. Marine Spatial Planning: From Policy to Practice (Woods Hole, MA)

Workshop Facilitator 2013. Water Diplomacy Workshop, MIT and Tufts Universities, Cambridge, MA

Symposium Host 2011. 2nd International Marine Conservation Congress (Victoria, Canada) "Can Innovative Entrepreneurship Save Seafood and the Seas?"

Graduate Researcher 2006-2011. Prof. Farooq Azam, Marine Microbial Ecology, Scripps Institution of Oceanography (San Diego, CA)

Program Coordinator 2008-2011. Scripps Community Outreach Program for Education (SCOPE), Scripps Institution of Oceanography (San Diego, CA)

Research Specialist 2010. Coral Reef Microbial Ecology, The Nature Conservancy and The

Kohala Center (Kona, Hawai'i)

Research Associate 2005-2006. Assay Development, Ambit Biosciences Inc. (San Diego, CA)

Marine Scientist 2004-2005. Gandoca-Manzanillo Wildlife Refuge (Manzanillo, Costa Rica)

Lab Manager 2003-2004. Prof. Jeff Powell, Conservation Genetics, Yale University (New Haven, CT)

Research Fellow 2002. Prof. Nancy Knowlton, Coral Ecology, Smithsonian Tropical Research Institute (Bocas del Toro, Panama)

Research Assistant 2001. Prof. Allen Nicholas, Genetics, The Curie Institute (Paris, France)

Research Intern 2000. Prof. James Harvey, Marine Vertebrate Ecology, Moss Landing Marine Lab (Moss Landing, CA)

Professional Working Groups

2021-present Environmental Law Alliance Worldwide (ELAW) Marine Working Group

2020-2021 Ocean Vision's Ocean-Based Carbon Dioxide Removal Working Group (Steering committee member)

2012-2017 NSF Research Coordination Network: Evaluating the Impacts of a Changing Ocean on Management and Ecology of Infectious Marine Disease.

2012 National Center for Ecological Analysis and Synthesis (NCEAS): Coral Reef Preservation

2006-2009 World Bank/ Global Environment Facility: Coral Reef Targeted Research Working Group on Coral Disease

Selected Presentations (of >200)

Roundtable Session Moderator (2024) [“Blue Economy and Its Impacts on Small-Scale Fisheries: Moving Towards Just and Equitable Ocean Use and Protection”](#) World Fisheries Congress, Seattle, WA, USA. Hosted 8 speakers from 3 different continents from ELAW's Marine Working Group.

M. Garren (2023) “Opportunities for Services Providers to Engage with EM Program Development in Tuna-RFMOs”. Pew Workshop: Electronic Monitoring Service Providers for RFMO Engagement, Aberdeen, Scotland

M. Garren (2023) [“Consideraciones para innovar y escalar la tecnología en la pesca”](#). Marea Digital (a workshop on technology in small scale fisheries), La Paz, Mexico. Invited speaker.

M. Garren (2022) “The Current Landscape of Electronic Monitoring Globally”. Global Electronic Monitoring Symposium, Honolulu, Hawaii. Invited plenary speaker.

M. Garren (2021) [Duke Law's Fishing for Data Podcast: Episode 3 Electronic Monitoring and the Magnuson-Stevens Act](#). Invited guest expert.

M. Garren & A. Brett (2021) Net Gains Alliance Seminar Series: [“Supporting Innovation & Technology Compatible Fisheries Management Frameworks in the US”](#). Virtual. Invited speaker.

M. Garren (2020) United Nations World Ocean Day: “[Blue Economy and Private Sector Impact](#)”. United Nations Headquarters, NY (shifted to virtual for COVID-19). Invited speaker.

M. Garren (2020) Sustainability Seminar Series: “The Triple Bottom Line in Ocean and Coastal Sustainability”. Middlebury Institute of International Studies, Monterey CA. Invited speaker

M. Garren (2019) Board meeting for BlueBelt Initiative on fisheries management & cooperation among the African States bordering the Atlantic Ocean (ATLAFCO; currently 22 member nations). Delivered a 2-hour workshop on fisheries management tools at the invitation of the Moroccan government. Casablanca, Morocco. Invited expert

M. Garren (2019) WorldFish Food for Thought Seminar Series: “Using Sunlight and Cellular Networks to Bring New Management Tools to Small Scale Fisheries”. WorldFish Headquarters, Penang, Malaysia. Invited speaker

M. Garren (2018) Panel hosted by Indonesian IUU Task Force (#115): “Policy Implementation of Combatting Illegal, Unreported, and Unregulated Fishing”. Our Ocean Conference, Bali, Indonesia. Invited speaker (1 of 3 speakers on panel)

M. Garren (2018) “[Registro de las rutas de las embarcaciones menores en Alto Golfo](#)”. Foro Economico de Pesca y Acuicultura, Mexico City, Mexico. Invited speaker

M. Garren (2018) “Technology in support of robust fisheries management and reduced ghost gear”. Sustainable Seafood Summit, Barcelona, Spain. Invited speaker

M. Garren (2018) Invited workshop contributor and speaker as a technical expert for the United Nations Food and Agriculture Organization. FAO’s General Fisheries Commission for the Mediterranean VMS and related control system workshop, Beirut, Lebanon. Invited expert/ speaker

M. Garren (2017) Smithsonian’s Earth Optimism Summit. Washington, DC. Invited speaker https://www.youtube.com/watch?v=kC_5Z26nL3s

M. Garren (2016) Plenary Speaker for the Italian Society for Ecology. Milan, Italy. Invited speaker

M. Garren (2015) Senate Briefing on Technology for Small Scale Fishery Management. Washington, DC

M. Garren (2015) Plenary Panel Speaker at the Sustainable Seafood Summit. Valleta, Malta.

M. Garren (2015) “Bacterial Behaviors Shed Light on Ecosystem Function”. Woods Hole Oceanographic Institution, Woods Hole, MA. Invited seminar

M. Garren (2014) “The Sea We Rarely See: Connecting Microscale Processes to Ecosystem Function”. Monterey Bay Aquarium Research Institute, Monterey, CA. Invited seminar

M. Garren (2012) “The Sea We’ve Hardly Seen”. TEDx Monterey Event. Invited oral presentation. (http://www.ted.com/talks/melissa_garren_the_sea_we_ve_hardly_seen.html)

M. Garren (2012) “Linking Microscale Bacterial Behaviors to Large-scale Ecosystem Function”. Sustainability Seminar, Cornell University, Ithaca, NY. Invited departmental seminar.

M. Garren (2012) “Diving into the Unseen: Live Coral-Bacteria Interactions”. Climate Change Cluster Seminar, University of Technology Sydney, Sydney, Australia. Invited departmental seminar.

M. Garren, L. Raymundo, J. Guest, C.D. Harvell and F. Azam (2010) “Dynamic Interactions among Coral-Associated Bacteria in Response to Fish Farm Effluent Exposure”. American Society of Limnology and Oceanography Meeting, Portland, OR. Oral presentation.

M. Garren (2009) “Mariculture in a Changing Environment”. Scripps Environmental Advocates, La Jolla, CA. Invited oral presentation.

M. Garren, S. Smriga and F. Azam (2008) “Gradients of Coastal Fish Farm Effluents and Their Effect on Coral Reef Microbes”. 12th International Symposium on Microbial Ecology, Cairns, Australia. Poster presentation.

M. Garren (2006) “Una perspectiva sobre el manejo integrado de una area protegida marinocostero”. University of Costa Rica, San Jose, Costa Rica. Invited departmental seminar.

M. Garren, A. Caccone, N. Knowlton (2004) “Patterns of Association between Symbiodinium and Members of the *Montastraea annularis* Species Complex in the Bocas del Toro Archipelago, Panama”. 10th International Coral Reef Symposium, Okinawa, Japan. Poster presentation.

Selected Publications (of >35)

M. Garren, M. Michelin, V. Maharaj (2024) Technical Source Document on the Governance of Electronic Monitoring (EM) Systems for Industrial Tuna Fisheries. *Developed by the World Wildlife Fund Inc. (WWF-US) under the FAO Common Oceans Program*. [[Full PDF](#) and [Summary toolkit](#) available]

M. Chernaik, J. Chamberlin, M. Garren, R. Howard, M. Lu, F. Salinas, G. Wendling, B. Yednock (2024) How to Evaluate Environmental Impact Assessments for Oil and Gas Projects. *Environmental Law Alliance Worldwide (ELAW)* ISBN#: 979-8-218-48856-7 [[Full PDF](#)]

R. Moss-Christian, B. Hanchard, J.T. Mudge, M. Garren, M. Michelin, M. Zimring, C. Heberer (2022) [Final Draft Forum Fisheries Agency Electronic Monitoring Standards, Specifications, and Procedures](#). Adopted as interim guidelines by the FFA on May 12, 2022.

M. Garren, F. Lewis, L. Sanchez, D. Spina, A. Brett (2021) How Performance Standards Could Support Innovation and Technology Compatible Fisheries Management Frameworks in the U.S. *Marine Policy* <https://doi.org/10.1016/j.marpol.2021.104631> [Executive Summaries available in [Spanish](#) and [English](#)]

S. Haukebo, S. Poon, C. Cusack, M. Garren, J. Kenyon-Benson, E. Schindler, B. Tate (2021) SmartPass: An innovative approach to measure fishing effort using smart cameras and machine learning. <https://www.edf.org/sites/default/files/content/EDFSmartPass-whitepaper.pdf>

R. Vega Thurber, L.D. Mydlarz, M. Brandt, C.D. Harvell, E. Weil, L. Raymundo, B.L. Willis, S. Langevin, A.M. Tracy, R. Littman, K.M. Kemp, P. Dawkins, K.C. Prager, M. Garren, J. Lamb (2020) Deciphering coral disease dynamics: integrating host, microbiome, and the changing environment. *Frontiers in Ecology and Evolution*, 8

D.C. Claar, J. McDevitt-Irwin, M. Garren, R. Vega-Thurber, R. Gates, J. Baum (2020) Increased diversity and concordant shifts in community structure of coral-associated *Symbiodiniaceae* and bacteria subjected to chronic human disturbance. *Molecular Ecology*

J. McDevitt-Irwin, M. Garren, R. McMinds, R. Vega-Thurber, J. Baum (2019) Variable interaction outcomes of local disturbance and El Niño-induced heat stress on coral microbiome alpha and beta diversity. *Coral Reefs* DOI: 10.1007/s00338-019-01779-8

J. McDevitt-Irwin, J. Baum, M. Garren, R. Vega-Thurber (2017) Responses of Coral-Associated Bacterial Communities to Local and Global Stressors. *Frontiers in Marine Science* DOI:10.3389/fmars.2017.00262

M. Garren (2016) Microbial ecology: Algae feed a shift on coral reefs. *Nature Microbiology* DOI:10.1038/nmicrobiol.2016.61

M. Garren, K. Son, J. Tout, J. Seymour, R. Stocker (2016) Temperature-induced behavioral switches in a bacterial marine pathogen. *International Society for Microbial Ecology Journal* doi:10.1038/ismej.2015.216

M. Groner, R. Breyta, A. Dobson, C. S. Friedman, M. Garren, F. Gulland, J. Maynard, E. Weil, S. Wyllie-Echeverria, C.D. Harvell (2015) Emergency Response for Marine Diseases. *Science* 347:1210

J. Maynard, R. van Hooidonk, C. M. Eakin, M. Puotinen, S. F. Heron, M. Garren, J. Lamb, G. Williams, E. Weil, B. Willis, C.D. Harvell (2015) Climate projections of conditions that increase coral disease susceptibility and pathogen virulence. *Nature Climate Change* DOI: 10.1038/nclimate2625

M. Garren, K. Son, J.B. Raina, R. Rusconi, O. Shapiro, D. Bourne, J. Seymour, R. Stocker. (2014) Pathogen uses dimethylsulfoniopropionate as a cue to target heat-stressed corals. *International Society for Microbial Ecology Journal* 8: 999–1007

O. Shapiro, V. Fernandez, M. Garren, J. Guasto, F. Debaillon-Vesque, E. Kramarski-Winter, A. Vardi, R. Stocker (2014) Ciliary currents enhance mass transport in reef-building corals. *Proceedings of the National Academy of Sciences* doi: 10.1073/pnas.1323094111

M. Garren and F. Azam (2012) Corals shed bacteria as a potential mechanism of resilience to organic matter enrichment. *International Society for Microbial Ecology Journal* 6: 1159-1165

M. Garren, L. Raymundo, J. Guest, C.D. Harvell and F. Azam (2009) Resilience of coral-associated bacterial communities exposed to fish farm effluent. *PLoS One* doi:10.1371/journal.pone.0007319

M. Garren, J. Myers, C. Arney (2009) Rebalancing human-influenced ecosystems. *The Journal of Undergraduate Mathematics and Its Applications* 30: 100-107

M. Garren, S. Smriga and F. Azam (2008) Gradients of coastal fish farm effluents and their effect on coral reef microbes. *Environmental Microbiology* 10: 2299-2312.

M. Garren, S.M. Walsh, A. Caccone, N. Knowlton (2006) Patterns of association between *Symbiodinium* and the *Montastraea annularis* species complex on spatial scales from within colonies to between geographic regions. *Coral Reefs* DOI:10.1007/s00338-006-0146-1

Grants & Awards

2020 Net Gains Alliance Grant for “Building a Model Regulatory Framework for Fisheries Management that Supports Technology and Innovation”

2020 Finalist Ocean Award for Innovation (<https://www.boatinternational.com/luxury-yacht-events/ocean-awards/ocean-awards-finalists--39691/frame-4>)

2019 Foundation Grant: Augmenting National Scale Food Security through Sustainable Fisheries (\$1.2M program)

2019 Conscious Company World-Changing Woman (<https://twitter.com/consciouscomag/status/1084132966933110784>)

2019 CGIAR Big Data for Agriculture Inspire Challenge Awardee for Scale-Up (second award)

2018 National Geographic Society Marine Protection Prize (<https://www.nationalgeographic.org/newsroom/national-geographic-society-announces-winners-of-competition-to-combat-illegalfishing/>)

2018 SeaWeb's Seafood Champion for Innovation (<http://www.seafoodchampions.org/2018seafood-champion-awards/2018-innovation-finalists/pelagic-data-systems-2/>; <http://www.pelagicdata.com/2018-seafood-champion>)

2018 CGIAR Big Data for Agriculture Inspire Challenge Winner (<http://blog.worldfishcenter.org/2018/10/big-data-proposal-wins-2018-inspire-challenge/>)

2016 Schmidt Marine Technology Partners Grant to PDS

2013 Journal of Limnology and Oceanography Prize for Best Talk by a Junior Scientist

2012 Costerton Award from International Society for Microbial Ecology for "research that best evolves new theories in microbial ecology and wider interdisciplinary significance"

2012 Policy Traineeship from the Robert & Patricia Switzer Foundation

2010 Switzer Environmental Leadership Fellowship

2010 American Society of Limnology and Oceanography Student Travel Grant

2010 Travel Grant to "Ethics and Ecological Risk Assessment Symposium" hosted by University of Minnesota's Risk Assessment for Introduced Species and Genotypes IGERT program.

2009 IGERT/NSF Internship Grant

2008 IGERT/NSF Mini-Grant

2008 Zobel Fellowship

2006 National Science Foundation Graduate Research Fellowship (NSF GRFP)

2006 Integrative Graduate Education and Research Traineeship from National Science Foundation (IGERT)

2004 PADI Aware Foundation Mini-Grant

2003 Yale's Ellsworth Memorial Prize for "most distinguished thesis of the graduating class"

2003 Yale University Dean's Research Fellowship

2002 Thoreau Environmental Research Fellowship

Reviews

2007-present Aquaculture, Aquatic Sciences, Coral Reefs*, Disease of Aquatic Organisms*, Environmental Chemistry, Environmental Microbiology*, Frontiers in Marine Science*, International Society of Microbial Ecology Journal*, Journal of Marine Science and Engineering, mBio, Marine Ecology, Molecular Ecology, PLoS ONE*, Nature Reviews Microbiology, Proceedings of The Royal Society B*, The French National Research Agency (ANR), The National Geographic Society*, National Fish and Wildlife Foundation* (NFWF), National Science Foundation* (NSF), World Bank (* indicates multiple reviews)

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Charleston, OR 97420
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EDUCATION

Doctor of Philosophy, Environmental and Evolutionary Biology: 2013

University of Louisiana, Lafayette, LA

Dissertation: Population genetic structure and natural selection in blue crabs, *Callinectes sapidus*.

Master of Science, Coastal Marine and Wetland Studies: 2005

Coastal Carolina University, Conway, SC

Thesis: Habitat utilization by multiple shark species in a southeastern salt marsh estuary.

Bachelor of Arts, Environmental Studies: 1998

University of Oregon, Eugene, OR

Minors in Biology and Planning, Public Policy, and Management

Oregon Institute of Marine Biology, Charleston, OR (Spring 1998)

University of Copenhagen, Copenhagen, DK (Fall 1997)

CURRENT POSITION (2017 - present)

Reserve Manager, South Slough National Estuarine Research Reserve

Oversee day-to-day operations and management of a 7,000-acre coastal protected area under the supervision of the Director of Oregon Department of State Lands and at the direction of the Governor-appointed Reserve Management Commission. Duties include:

- **Human Resources Management** – supervision and support for 19 permanent employees and additional grant-supported temporary staff and interns.
- **Land and Facilities Management** – oversee operation and management of reserve including a public visitor center, trails, research lab, and support facilities.
- **Grants, Finance and Contracts Administration** – prepare budget requests, grant proposals, reports, and contracts to support personnel, operations, facility improvement projects, land acquisitions, and research, education, and stewardship projects.
- **Project Development and Implementation** – lead multiple teams in long range and short-term strategic planning and the development, implementation, and evaluation of research, education, and stewardship projects tied to coastal management.
- **State and Federal Policy** – implementation of state and federal policies, statutes, and rules related to the Reserve and in coordination with the National Oceanic and Atmospheric Administration's oversight of the National Estuarine Research Reserve System; also propose and contribute to necessary state rulemaking and legislative concepts.
- **Collaborative Partnerships** – develop and maintain constructive partnerships with relevant state and federal agencies, tribal governments, non-profits, and universities through the creation and maintenance of formal cooperative agreements.

RESEARCH EXPERIENCE

Lead Scientist/Research Coordinator, South Slough National Estuarine Research Reserve (2014-2018)
Courtesy Faculty Member, University of Oregon, Oregon Institute of Marine Biology

Coordinated research and monitoring activities for South Slough Reserve, including work with visiting researchers and students. Projects included native oyster restoration, fish and invertebrate diversity surveys, eelgrass community assessments and mapping, ecology of invasive species, and the application of environment DNA for estuarine monitoring. Guided strategic planning and direction of the science team comprised of five research professionals and additional interns and temporary staff.

Postdoctoral Research Scientist, University of Louisiana (2013-2014)

Designed and implemented a molecular genetics investigation as part of a collaborative project with Tulane University and the Louisiana Universities Marine Consortium to study the effects of the Deepwater Horizon oil spill on blue crab populations in Louisiana. Duties included the experimental design of a laboratory oil exposure experiment, data collection, molecular work, and the development of genetic markers from Next Generation Sequencing data.

Doctoral Fellow, Graduate Research Assistant, University of Louisiana (2007-2013)

Designed and carried out a population genetics study on blue crabs in the Gulf of Mexico and along the Atlantic Coast of the US. Duties included experimental design, development of a field-based sampling program, specimen collection in Louisiana, and coordination of a multi-state sampling effort. Laboratory duties included the development of genetic markers and collection of genetic data by sequencing and genotyping of single nucleotide polymorphisms (SNPs).

Graduate Research Assistant, Coastal Carolina University (2003-2005)

Designed and implemented a field-based investigation of habitat use of sharks and rays in a salt marsh estuary in South Carolina. Recruited, trained and coordinated more than 50 volunteers and one full-time research assistant. Additional responsibilities included experimental design, coordination of boat use, maintenance of sampling equipment, data collection and database management, data analysis, and presentation of results in professional documents and presentations.

TEACHING AND OUTREACH EXPERIENCE

Lab Coordinator, University of Louisiana (2013)

Genetics and Evolution Lab, Bio 234 (1 semester)

Graduate Teaching Assistant, University of Louisiana (2007-2013)

Genetics and Evolution Lab, Bio 234 (4 semesters)

Molecular and Cellular Engineering Lab, Bio 454 (1 semester)

Introductory Biology Lab, Bio 112 (2 semesters)

Graduate Teaching Assistant, Coastal Carolina University (2003-2005)

Field Studies in Shark Biology in Bimini, Bahamas, Bio 473 (1 semester)

Principles of Ecology Lab, Bio 370 (2 semesters)

Introductory Biology Lab, Bio 121-122 (2 semesters)

Youth Programs Coordinator, North Cascades Institute (2005-2007)

Coordinated all aspects of a residential science-based and natural history education program for students (grades 4-12) in North Cascades National Park. Designed and developed field science-based education curriculum, with emphasis on forest and aquatic ecology, environmental awareness, and natural history of the North Cascades. Supervised, trained, and mentored graduate students in residence from the Master's of Education program through Western Washington University. Hired, trained and supervised seasonal educators and naturalists. Coordinated first-aid and safety training of staff and implemented safety policy framework. Oversaw all aspects of residential family education programs at the North Cascades Environmental Learning Center during the summer months, including recruitment, hiring, and training of staff, budget management, and on-the-ground program facilitation and education.

Continuing Education Instructor, Coastal Carolina University (2005)

Taught classes in beach ecology, marine invertebrates, and sea turtle biology to the local community.

BOARD SERVICE AND ADVISORY EXPERIENCE

Bureau of Land Management, Western Oregon Resources Advisory Committee (2022 to present)

Representative for Public Land Management for Recreation

National Estuarine Research Reserve Association Board of Directors (2017 to present)

Executive Committee, Member at Large since 2022

Pacific Marine and Estuarine Fish Habitat Partnership Steering Committee (2020 to present)

Governance Committee, Chair-elect since 2023

Elakha Alliance Advisory Council (2020 to present)

Partnership for Coastal Watersheds Steering Committee (2014 to present)

Coos Watershed Association Board of Directors (2017 – 2022)

Vice President, 2019 to 2020. President, 2020 to 2021.

PROFESSIONAL PUBLICATIONS

Thomas, M.D., J.B. Schram, Z.F. Clark-Henry, **B.K. Yednock**, A.L. Shanks, A.W.E. Galloway. 2020. Juvenile Dungeness crabs (*Metacarcinus magister*) selectively integrate and modify the fatty acids of their experimental diets. Philosophical Transactions of the Royal Society B 375, no. 1804 (2020): 20200038.

Whalen, M.A., R.D Whippo, ... **B.K. Yednock**, *et al.* 2020. Climate drives the geography of marine consumption by changing predator communities. Proceedings of the National Academy of Sciences, 117(45), 28160-28166.

Yamada, S.B., C. Lundeberg, T. Weldon, J. A. Prickett, A. Randall, **B. Yednock**, C. Geierman, C. Williams. 2016. Status of the European Green Crab, *Carcinus maenas*, in Oregon and Washington Estuaries in 2016. Technical Report.

Wasson, K., C. Zabin, J. Bible, S. Briley, E. Ceballos, A. Chang, B. Cheng, A. Deck, T. Grosholz, A. Helms, M. Latta, **B. Yednock**, D. Zacherl, M. Ferner. 2015. A guide to Olympia oyster restoration and conservation: environmental conditions and sites that support sustainable populations. Elkhorn Slough National Estuarine Research Reserve, pp.42.

Yednock, B.K., T.J. Sullivan, J.E. Neigel. 2015. De novo assembly of a transcriptome from juvenile blue crabs (*Callinectes sapidus*) following exposure to surrogate Macondo crude oil. BMC Genomics 16:521.

Prada, C., M.B. DeBiasse, J.E. Neigel, **B.K. Yednock**, J.L. Stake, Z.H. Forsman, I.B. Baums, and M.E. Hellberg. 2014. Genetic species delineation among branching Caribbean Porites corals. Coral Reefs:1-12.

Yednock, B.K. and J.E. Neigel. 2014. Detecting selection in the blue crab, *Callinectes sapidus*, using DNA sequence data from multiple nuclear protein-coding genes. PLoS ONE 9: e99081.

Yednock, B.K. and J.E. Neigel. 2014. An investigation of genetic population structure in blue crabs, *Callinectes sapidus*, using nuclear gene sequences. Marine Biology: 161, 871-886.

Yednock, B.K. and J.E. Neigel. 2011. Rethinking mechanisms that shape marine decapod population structure. In: Held C. et al. (Ed.) Phylogeography and population genetics in Crustacea. Crustacean Issues 19: 57-73.

Abel, D.C., R.F. Young, J.A. Garwood, M.J. Travaline, **B.K. Yednock**. 2007. Survey of the shark fauna in two South Carolina estuaries and the impact of salinity structure. In: McCandless, C. et al. (Ed.) Shark nursery grounds of the Gulf of Mexico and the east coast waters of the United States, American Fisheries Society Symposium 50:109-124.

Sawicki, J., **B.K. Yednock**, R. Bender. 1998. Coos Bay salinity intrusion study: the effects of deepening the channel on striped bass (*Marone saxatilis*) and other fish populations. 1998 Annual Report. Oregon Department of Fish and Wildlife, Contract Number: E969600027.

Megan Egler

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Education

- 2024** **Ph.D. Natural Resources, University of Vermont**
Rubenstein School of Environment & Natural Resources
- 2020** **Graduate Certificate in Ecological Economics, University of Vermont**
Rubenstein School of Environment & Natural Resources
- 2015** **M.Sc. Food, Agriculture and Resource Economics, University of Guelph**
Dept. Food Agriculture & Resource Economics
- 2012** **B.Sc. Environmental and Conservation Sciences, University of Alberta**
Dept. Resource Economics and Environmental Sociology
Major: Environmental Economics and Policy

Research Appointments

- 2024 -** **Postdoctoral Fellow, Institute for Integrated Energy Systems**
School of Public Administrations, University of Victoria
- Research on public perceptions of energy transition within rural and medium-sized communities in Western Canada and the effective and inclusive design of policies advancing both climate and justice goals.
- 2018-2024** **Graduate Fellow, Gund Institute for Environment**
University of Vermont
- Dissertation research around narrative, power and energy transitions within fossil fuel producing regions
- 2023-2024** **Research Assistant, NSF Navigating the New Arctic: Sustainable Transitions through Arctic Redevelopment**
University of Vermont
- Qualitative interviews with Northern Alaskan communities and government officials around Arctic mine closures and redevelopment in Alaska, USA.
- 2021-2023** **Contract Researcher, Parkland Institute**
University of Alberta
- Research publication and public facing report in partnership with Oxfam Canada on the equity dimensions of environmental liabilities in the Canadian fossil fuel industry. Responded to media inquiries and engaged with journalists regarding key research results and policy implications.
 - Research publication in partnership with Environmental Defence Canada on climate change and environmental liabilities in the Canadian fossil fuel industry.
- 2023** **Research Consultant, David Suzuki Foundation**
- Research in preparation for public comment on Ksi Lisims Liquid Natural Gas (LNG) Project in British Columbia, Canada.
- 2021-2022** **Junior Consultant, United Nations Research Institute for Social Development**
- Quantitative assistance on the UNRISD Flagship Report 2022 on Inequalities and a New Eco-Social Contract.
- 2021** **Research Assistant, Ecozoic Policy Project**
University of Vermont
- Policy research and strategic communication on just transitions and job guarantees in the United States and Vermont.
- 2018** **Research Volunteer, Nicaragüense para las Mujeres Productora**

- CUSO International
- Participatory Action Research for the design of a pricing observatory and agricultural value chain development.
- 2017-2018 **Value Chain Analyst, Association of Producers and Exporters of Nicaragua**
CUSO International
- Project lead for a pro-poor value chain assessment of coconut production in South Caribbean Coast Autonomous Region of Nicaragua.
- 2013-2015 **Graduate Researcher, Dept. of Food Agriculture and Resource Economics**
University of Guelph
- Econometric modeling of food aid program efficacy in sub-Saharan Africa.
- 2013 **Development Intern, Fundación PROINPA**
Sustainable agricultural research and development
- Statistical Analyst for a project developing mycorrhizal seed treatments for small-scale farming in the Andean high lands.
- 2012 **Research Assistant, Dept. of Resource Economics and Environmental Sociology**
University of Alberta
- Evaluation of US trade policy and its effect on the survival of trade relationships with developing country partners.

Select Teaching Appointments

- Spring, 2025 **Instructor and course design, Coastal Climate Challenge, Experiential learning**
The Coast Climate Solutions Leaders graduate training program, University of Victoria
- Spring 2022 **Co-Instructor and course design, Community Development Economics**
Dept. Community Development Economics, University of Vermont
- Fall 2020 **Co-Instructor, Human Ecology and Health in the Arctic**
Rubenstein School of Environment and Natural Resources, University of Vermont

Community & Academic Service

Leadership

- 2023- Director of Research, Canadian Society for Ecological Economics
- 2022-2023 Board Member, International Society for Ecological Economics

Community Organizing

- 2019 - 2024 Organizer, DegrowBTV in Burlington, Vermont
- Partnered with various community organizations to coordinate mutual aid efforts, organized and facilitated public education, community arts and visioning events
- 2016 Team lead, Drapen I Havet (Drop in the Ocean)
- Responsible for food distribution and children's activities in Souda Migrant Camp, Chios, Greece.

Professional Affiliations

Institute for Integrated Energy Systems, Accelerating Community Energy Transformation
UNRISD Network of Collaborating Researchers
UN Harmony with Nature Knowledge Network
Leadership for the Ecozoic
Petrocultures Research Group
Canadian Society for Ecological Economics

Select Publications

- in review* **Egler, M.,** Morse, C. 'Power, narrative, and the oil and gas worker: Meaning making and the maintenance of extractive subjectivities', *in review at Antipode*.
- 2024 **Egler, M.,** Barbieri, L. 'Prefiguring energy futures: hybrid energy initiatives and just

- transitions in fossil fuel regions'. *Energy Research & Social Science*, 118, 103830.
- 2024 Farley, J., Melgar, R., Burke, M., Danielsen, J., **Egler, M.**, et. al. 'Rethinking Ecosystem Services from the Anthropocene to the Ecozoic: Nature's Benefits to the Biotic Community'. *Ecosystem Services*, 67, 101624.
- 2021 **Egler, M.** 'Not Well Spent: A review of \$1-billion federal funding to clean up Alberta's inactive oil and gas wells'. Parkland Institute and Oxfam Canada. Edmonton, Canada.
- 2020 Bliss, S., & **Egler, M.** 'Ecological Economics Beyond Markets'. *Ecological Economics*, 178, 106806.
- 2020 Koliba, C., **Egler, M.**, Posner, S. Governing for sustainable development: rethinking governance and ecological economics. In Sustainable Wellbeing Futures: A Research and Action Agenda for Ecological Economics. Costanza, R., Erickson, J. Farley, J., Kubiszewski. Edward Elgar Publishing Limited.

Selected Presentations

- 2025 'Energy capital, discursive power and the shaping of energy futures.' Invited seminar for the **New Energy Series at The Arthur L. Irving Institute for Energy & Society, Dartmouth**
- 2025 'The divided politics of energy transition and support for climate-justice policies in Western Canada's small and medium communities.' **Canadian Economics Association Annual Conference**
- 2024 'Realizing the clean energy transition: Large-scale surveys of citizen perceptions of energy transition technologies and policies in small and medium communities of Western Canada.' Presentation for the **Environmental Politics and Governance Network Survey Workshop**
- 2022 'Ecological Economics and the Rights of Nature.' Invited panelist to the **Eleventh Interactive Dialogue of the General Assembly on Harmony with Nature**
- 2021 'Not well spent: A review of \$1-billion federal funding to clean up Alberta's inactive oil and gas wells.' Invited panelist to the **Publish What You Pay US/Canada Webinar**
- 2021 'Informing the energy transition: Deep dive into methane emissions and reserve disclosures.' Invited panelist to the **The Big Cleanup: How Canadians are Paying to Reclaim Polluters' Wells Webinar**

Professional Training and Workshops

- 2024 Workshop on Surveys, Survey Experiments, and Field Experiments, The Environmental Politics and Governance Network
- 2024 The Arthur L. Irving Institute for Energy & Society New Energy Summit, Dartmouth
- 2020 Decolonial and Non-Hierarchical Research Methods Workshop, San Cristobal de las Casas, Mexico

Technical skills

Programming & Statistical Computing: Python • R • Excel • SPSS • Gephi

Qualitative data analysis: NVivo

Languages: English (Native), Spanish (Intermediate), French (A1)