

Nicole C. Pittoors

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Research Interests

Molecular ecology, deep-sea benthic ecology, metacommunity dynamics, larval ecology, and reproductive biology.

Education

2020-Present **Doctor of Philosophy in Biological Sciences**

Lehigh University, Bethlehem, PA

Concentration: Evolutionary and Behavioral Biology

Advisor: Dr. Santiago Herrera

Dissertation: Metacommunity dynamics of the mesophotic coral reef benthos within the Northwestern Gulf of Mexico

2013-2017 **Bachelor of Science in Biology, Minor in Mathematics**

Northern Michigan University, Marquette, MI

Concentration: Ecology

Advisor: Dr. Jill Leonard

Awards

2024 Lehigh University Department of Biological Sciences Nemes Fellowship [\$34,000]

2021 National Science Foundation Graduate Research Fellowship [\$138,000]

2021 Deep Sea Biology Society Cruise Bursaries Award [\$2,000]

2016 and 2018 Charlotte Mangum Student Travel Award- SICB [estimated \$600]

2016 Northern Michigan University Graduate Education and Research Grant [\$500 1 of 3 awards]

2013-2017 Northern Michigan University Honors Award

Research Positions

2020-Present Graduate Research Assistant at Lehigh University. *Principal Investigator: Dr. Santiago Herrera*

2018-2020 Laboratory Technician at Harvard University. *Principal Investigator: Dr. Benjamin de Bivort.*

2017 Guest Student at Woods Hole Oceanographic Institution. *Principle Investigators: Drs. Kirsten Meyer-Kaiser and Lauren Mullineaux.*

2014-2017 Undergraduate Independent Researcher at Northern Michigan University. *Advisors: Dr. Jill Leonard*

2013 Volunteer Technician at Michigan's Department of Natural Resources. *Advisors: Daniel Traynor and Dr. Shawn Sitar.*

Presentations

2024 Characterizing biodiversity of mesophotic reef benthos using Autonomous Reef Monitoring Structures (ARMS). **Poster.** 3rd National Workshop on eDNA. John Hopkins University. Laurel, MD.

2023 Characterizing biodiversity of mesophotic reef benthos using Autonomous Reef Monitoring Structures (ARMS). **Speed Talk and Poster.** International Symposium on Deep-Sea Corals. Edinburgh, Scotland.

2023 Characterizing biodiversity of mesophotic reef benthos using Autonomous Reef Monitoring Structures (ARMS). **Oral Presentation.** ConnectivY of CoraL Ecosystems in the Gulf of Mexico project PI-MTAG meeting. Smithsonian Institution, Washington, D.C.

- 2017 Multiple mechanisms of succession at work in subtidal fouling communities. **Oral Presentation.** Western Society of Naturalists. Pasadena, CA.
- 2017 Mechanisms in ecological succession in subtidal fouling communities. Summer Student Research Forum. **Speed Talk and Poster.** Woods Hole Oceanographic Institution. Woods Hole, MA.
- 2017 Effects of pH and temperature on the Harpacticoid *Tisbe biminiensis* growth, survivorship, and morphology. **Oral Presentation.** Society of Integrative and Comparative Biology. New Orleans, LA.
- 2016 The role of *Diadema antillarum* on coral diversity and abundance. Northern Michigan University Research Celebration. **Oral Presentation.** Marquette, MI.
- 2015 Humpback whale (*Megaptera novaeangliae*) behavioral ecology field methods in Puerto Rico. **Oral Presentation.** Northern Michigan University Research Celebration. Marquette, MI.

Peer-Reviewed Publications

- Herrera, S., Chadwick, W. W., Jackson, M. G., Konter, J., McCartin, L., **Pittoors, N.**, Bushta, E., Merle, S. G. 2023. From basalt to biosphere: Early non-vent community succession on the erupting Vailulu'u deep seamount. *FMARS*. 10. DOI: [10.3389/fmars.2023.1110062](https://doi.org/10.3389/fmars.2023.1110062)
- McDermort, J.M., Parnell-Turner, R., Barreyre, T., Herrera, S., Downing, C., **Pittoors, N.**, Pehr, K., Vohsen, S.A., Dowd, W.S., Wu, J., Marjanoic, M., Fornari, D. Discovery of active off-axis vents at 9° 54'N East Pacific Rise. *PNAS*. 119. DOI: [10.1073/pnas.2205602119](https://doi.org/10.1073/pnas.2205602119)
- Maciejewski, M.F., Meyer, K.S., Wheeler, J.D., Anderson, E.J., **Pittoors, N.C.**, Mullineaux, L.S. Helical swimming as an exploratory behavior in competent larvae of the eastern oyster larvae (*Crassostrea virginica*). *J Exp Mar Biol Ecol*. 510: 86-94. DOI: [10.1016/j.jembe.2018.10.007](https://doi.org/10.1016/j.jembe.2018.10.007)

Publications in Review and Preparation

- Maloney, R., Ye, A., Saint-Pre, A.K., Alisch, T., Zimmerman, D., **Pittoors, N.C.**, de Bivort, B.L. Drift in individual behavioral phenotype as a strategy for unpredictable worlds. *In preparation*. Target Journal: *PNAS*.
- McCartin, L.J., Saso, E., Vohsen, S., **Pittoors, N.C.**, Demetriades, P., McFadden, C., Quattrini, A., and Herrera, S. New eDNA meta-barcoding primers for anthozoan coral biodiversity assessment. *bioRxiv* 2023.10.26.564240 (2023) DOI:[10.1101/2023.10.26.564240](https://doi.org/10.1101/2023.10.26.564240). *Under review in Coral Reefs*.
- Meyer, K.S., **Pittoors, N.C.**, Solow, A., Mullineaux, L.S. Priority effects in succession in a marine fouling community. *In preparation*. Target journal: *Ecology Letters*.

Teaching Experience

- 2020 Graduate Teaching Assistant. Genetics Laboratory. Lehigh University.
- 2017 Teaching Assistant. Advanced Applied Statistics. Northern Michigan University.
- 2016-2017 Campus Tutor. Ecology and Biological Statistics. Northern Michigan University.
- 2015 Teaching Assistant. Freshman Biology Seminar. Northern Michigan University.

Mentoring

- 2024-Present Jamie Lai, Lehigh University Undergraduate Student
- 2023-Present Sophia Mihalek, Lehigh University Undergraduate Student
- 2016-2017 Grace Grimes, Northern Michigan University Undergraduate Student and McNair Scholar

Relevant Coursework

Deep-Sea Biology (Harvard Graduate School of Arts and Sciences), Genomics, Molecular Ecology I & II, Marine Geochemistry, Marine Biology, Oceanography, Coevolution, Ecology, Ecology Theory and Methods, Ecological

Animal Physiology, Invertebrate Zoology, Conservation Biology, Ichthyology, Cellular and Molecular Biology, Evolution, Advanced Field Marine Biology, Calculus I-III, Differential Equations, Biostatistics, Advanced Applied Statistics, Organic Chemistry, Calculus-based Physics

Other Professional Activities

Since 2020	Deep-Sea Biology Society Student Member
Since 2018	Society for Women in Marine Science Student Member
2017	Sigma Xi Associate Member
2015-2019	SICB Student Member
2016-2018	WSN Student Member
2014	PADI Open water SCUBA certified

Diversity in STEM and Anti-Racist Training

2023	<i>Advancing Antiracism, Diversity, Equity, and Inclusion in STEMM Organizations: Beyond Broadening Participation</i> Seminar on recommendations and actions that leaders in STEMM organizations can take to foster a culture of diversity, equity, and inclusion. [at Lehigh University]
2020	<i>What is an Anti-Racist Classroom? What Actions Can I Take to Create One?</i> Workshop on concrete actions that will help create an anti-racist classroom, including remote or blended courses [at Lehigh University]
2019	<i>Creating Space: Allyship Workshop</i> Understanding social justice beyond a U.S. context and how to make social justice efforts more inclusive and accessible [at Harvard]
2019	<i>Optimizing the Intern Experience: A Woods Hole NSF Workshop</i> A series of seminars and workshops aimed to strengthen undergraduate programs that seek to increase diversity in the geosciences workforce [at WHOI]

Science Communication Training and Outreach

2024-Present	<i>Skype a Scientist Volunteer</i> Organization that provides classrooms of students a video conference with a scientist to “meet” scientists and have their questions answered.
2020-Present	<i>Letters to a Pre-Scientist Volunteer</i> Pen pal program that pairs fifth to tenth grade “pre-scientists” in US low-income communities with STEM professional volunteers during science class.
2021-2023	<i>Biological Organization of Graduate Students (BOGS) Treasurer.</i> Helped organize events for student professional development, advocate for students, assist with recruiting students to the program, and planned community events
2016	<i>Story Art for Science Communication, Interactive Workshop</i> How to outline your scientific stories using techniques that Pixar Animation Studios uses to construct and translate stories into visual form [at WSN Meeting]
2016	<i>Communicating the Value of Natural History Through Exploration and Discovery Symposium</i> How to use natural history and observation as a tool to motivate a wide audience to care about and conserve the natural world [at WSN meeting]
2017	<i>Demystifying Public Perceptions of Science Workshop</i> Tools to bridge psychological research with science communication [at WSN Meeting]

Technical Skills

Languages and Platforms: R, ArcGIS, Python, MATLAB, Thin Plate Spline for Morphometric Analysis, SPSS Statistical Software, Windows, Linux, macOS, Autodesk Fusion 360, Adobe Creative Cloud, Photogrammetry for 3D reconstruction.

Hardware: Soldering, Circuits, Laser Cutting, and 3D Printing.

Molecular and Microscopy Techniques: Polymerase Chain Reaction, Protein Electrophoresis, DNA extraction, Metabarcoding, Next Generation Sequencing Technologies, Understanding and Usage of Biostatistics and Bioinformatics Algorithms, Reproductive Histology, Immunohistochemistry, Immunofluorescence, and Confocal Microscopy.

Field Work: Collection and preservation of deep-sea corals for museum voucher specimens and high-molecular weight DNA and RNA acquisition, fixation of deep-sea corals for microscopy and reproductive histology, recovery and processing of Autonomous Reef Monitoring Structures, ship-board experiments involving live deep-sea corals, leading remotely operated vehicle dives, photogrammetry, eDNA sampling and processing of niskin bottles and in-situ high-volume samplers, directing CTD tow-yo's to locate hydrothermal plumes, hydrothermal vent biological and geological sampling, isobaric gas-tight and major sampler preparation and sample acquisition, and fabrication and deployment of deep-sea equipment and benthic landers.

Research Expeditions

- 2024 R/V *Atlantis*. HOV *Alvin*. AT50-21. Monitoring hydrothermal fluid origin, crustal permeability, and seafloor morphology in preparation for the next volcanic eruption. Leg 3. East Pacific Rise 9° 50'N, Pacific Ocean. Starboard Observer on HOV *Alvin* dive AL5237, Port Observer on dive AL5241. 34 days.
- 2023 R/V *Falkor (too)*. ROV *SuBastian*. FKt230812. Hydrothermal Vents of the Western Galapagos. Galapagos Islands, Ecuador. 30 days.
- 2023 R/V *Falkor (too)*. ROV *SuBastian*. FKt230417. Health Diagnostics of Deep-Sea Corals. Puerto Rico. 19 days.
- 2023 R/V *Atlantis*. HOV *Alvin*. AT50-07. Monitoring hydrothermal fluid origin, crustal permeability, and seafloor morphology in preparation for the next volcanic eruption. Leg 2. East Pacific Rise 9° 50'N, Pacific Ocean. Starboard observer on HOV *Alvin* dive AL5147. 29 days.
- 2021 R/V *Point Sur*. ROV *Global Explorer*. ConnectivitY of CoraL Ecosystems (CYCLE). U.S. Gulf of Mexico. 13 days.
- 2021 R/V *Roger Revelle*. ROV *Jason*. AUV *Sentry*. RR2102: Monitoring hydrothermal fluid origin, crustal permeability, and seafloor morphology in preparation for the next volcanic eruption. Leg 1. East Pacific Rise 9° 50'N, Pacific Ocean. 39 days.

Press and Research Features

- 2024 Five New Hydrothermal Vents Discovered in the Eastern Tropical Pacific Ocean. Oceanus. <https://www.whoi.edu/press-room/news-release/five-new-hydrothermal-vents-discovered-in-the-eastern-tropical-pacific-ocean/>
- 2023 "The Charles Darwin Foundation raises awareness about ocean conservation in Times Square": Charles Darwin Foundation Blog Articles. <https://www.darwinfoundation.org/en/blog-articles/923-the-charles-darwin-foundation-raises-awareness-about-ocean-conservation-in-times-square>
- 2023 "New Hydrothermal Vent Found Near Galápagos": Marine Technology News. <https://www.marinetechologynews.com/news/hydrothermal-found-pagos-631128>

- 2023 "A history of Interdisciplinary Research": Schmidt Ocean Institute.
https://youtu.be/lytK3n1LC_Y?feature=shared
- 2023 "Unlike Anything Else on Earth": Schmidt Ocean Institute.
<https://youtu.be/YAW2x2OURZA?feature=shared>
- 2023 "Deep-Sea Chemical Laboratories": Schmidt Ocean Institute.
<https://youtu.be/svYFr892fGO?feature=shared>
- 2022 "Diving Deep - Biologist Nicole Pittoors travels to great depths to measure the health of the ocean" :
Lehigh University's ACUMEN Magazine. <https://flippingbook.lehigh.edu/ACUMEN-Spring-2022/22/>
- 2022 "Off-Axis High-Temperature Hydrothermal Field Discovered at East Pacific Rise ": Lehigh University
News. <https://www2.lehigh.edu/news/off-axis-high-temperature-hydrothermal-field-discovered-at-east-pacific-rise>
- 2022 "New Hydrothermal Field Discovered In East Pacific Ocean": Scripps Institution of Oceanography News.
<https://scripps.ucsd.edu/news/new-hydrothermal-field-discovered-east-pacific-ocean>
- 2022 "Off-axis high-temperature hydrothermal field discovered at the East Pacific Rise 9°54'N": Science Daily.
<https://www.sciencedaily.com/releases/2022/07/220718154327.htm>