

ANA M. PALACIO-CASTRO

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EDUCATION

Ph.D in Marine Biology and Ecology (2019) University of Miami (USA). Dissertation: *Abiotic Controls on Endosymbiotic Algal Communities and Their Implications for Coral Bleaching Susceptibility and Recovery*. Award of academic merit.

B.S. in Biology (2010) Universidad de Antioquia (Colombia). Thesis: *Comparison of methods for monitoring sessile benthic communities in "La Azufrada", coral reef, Gorgona Island National Natural Park*. 75 pp.

RESEARCH INTEREST

I am an Assistant Scientist at the Cooperative Institute for Marine and Atmospheric Studies (CIMAS) and NOAA's Atlantic Oceanographic and Meteorological Laboratory (AOML). My research focus has been on how ocean warming, acidification, diseases, and land-based sources of pollution affect corals and disrupt the coral-algal symbiosis, leading to coral bleaching and mortality. I also investigate environmental and genetic factors that enhance coral resilience in the face of multiple stressors and rapid environmental changes. I use field data, controlled laboratory experiments, and molecular techniques to understand corals' susceptibility and tolerance to these stressors.

PROFESSIONAL EXPERIENCE

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|---|--------------|
| Assistant Scientist – UM-CIMAS, NOAA-AOML | 2023-current |
| Postdoctoral Researcher – UM-CIMAS, NOAA-AOML | 2022-2023 |
| Postdoctoral Fellow - National Research Council | 2019-2021 |
| Graduate Research Assistant – University of Miami (UM) - RSMAS | 2013-2018 |

GRANTS, FELLOWSHIPS, AND AWARDS (\$4,831,695)

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|-----------|---|
| 2025 | NOAA Ocean and Atmospheric Research Omics Grant: <i>SCTLD environmental co-factors</i> (PI -\$120,229) |
| 2023-2027 | National Ocean Service (NOS), National Oceanic and Atmospheric Administration (NOAA): <i>Characterizing and forecasting coastal ecosystem responses to multiple stressors for management applications in South Florida</i> (PI - \$4,080,792) |
| 2023-2024 | Florida Department of Environmental Protection (FDEP): <i>High-replication assessment of the effects of poor water quality on South Florida coral health and susceptibility to Stony Coral Tissue Loss Disease</i> (PI - \$380,553) |
| 2022-2024 | NOAA Ocean and Atmospheric Research Omics Grant: <i>SCTLD environmental co-factors</i> (PI -\$340k) |
| 2022-2023 | Florida Department of Environmental Protection (FDEP): <i>Assessing the effects of environmental co-factors on SCTLD transmission and progression rates</i> (PI - \$145,350) |
| 2019-2020 | US National Academy of Sciences NRC Postdoctoral fellowship (\$115,000) |
| 2017 | David Rowland Fellowship (\$3,500) |
| 2012-2017 | Full scholarship from the Colombian Ministry of Science and Technology (COLCIENCIAS) to pursue a PhD abroad. (\$210,000) |

PUBLICATIONS

Refereed Journal Articles

1. **Palacio-Castro AM**, Soderberg N, Zagon Z, et al. (2025) Elevated temperature decreases stony coral tissue loss disease transmission, with little effect of nutrients. *Scientific Reports*. doi:10.1038/s41598-025-06322-0
2. **Palacio-Castro AM**, Kroesche D, Enochs IC, Kelble C, Smith I, Baker A, Rosales SM (2025) Genotypes of *Acropora cervicornis* in Florida show resistance to either elevated nutrients or disease, but not both in combination. *PLOS One*. doi:10.1371/journal.pone.0320378
3. Morris JT, Edwards CB, Webb A, Barkley H, Viehman TS, **Palacio-Castro AM**, Wong M, Ramos-Rosado A, Hirsh HK, Besemer N, Petrovic V, Perry CT, Simmons KR, Enochs IC (2025) Three-dimensional photogrammetry-based monitoring to enhance site-level carbonate budget assessments of coral reefs. *Limnol Oceanogr Methods*. doi:10.1002/lom3.70000
4. Hirsh HK, Oliver TA, Dobbelaere T, **Palacio-Castro AM**, Barkley HC, Webb AE, Hanert E, Enochs IC (2025) Statistical prediction of in situ coral reef carbonate dynamics using endmember chemistry, hydrodynamic models, and benthic composition. *Aquatic Geochemistry*. doi:10.1007/s10498-025-09438-x
5. Serrano X, Rosales S, Miller M, **Palacio-Castro AM**, Williamson O, Gomez A, Baker A (2024) Sediment source and dose influence the larval performance of the threatened coral *Orbicella faveolata*. *PLOS One*. doi:10.1371/journal.pone.0292474
6. Webb AE, **Palacio-Castro AM**, Cooke K, Eaton KR, Chomitz B, Soderberg N, Chakraborty M, Zagon Z, Boyd A, Kiel PM, DeMerlis A, Perry CT, Enochs IC (2024) Rubble persistence under ocean acidification threatened by accelerated bioerosion and lower-density coral skeletons. *Glob Change Biol*. doi:10.1111/gcb.17371
7. Enochs IC, Soderberg N, **Palacio-Castro AM**, Eaton K (2024) Sequential Treatment Application Robot (STAR) for high-replication marine experimentation. *HardwareX*. doi:10.1016/j.ohx.2024.e00524
8. **Palacio-Castro AM**, Enochs IC, Besemer N, Boyd A, Jankulak M, Kołodziej G, Hirsh HK, Webb AE, Towle EK, Kelble K, Smith I, Manzello DP (2023) Coral reef carbonate chemistry reveals interannual, seasonal, and spatial impacts on ocean acidification off Florida. *Global Biogeochem Cy*. doi:10.1029/2023GB007789
9. Connelly MT, Snyder GA, **Palacio-Castro AM**, Gillette PR, Baker AC, Traylor-Knowles N (2023) Antibiotics reduce *Pocillopora* coral-associated bacteria diversity, decrease holobiont oxygen consumption, and activate immune gene expression. *Molecular Ecology*. doi:10.1111/mec.17049
10. **Palacio-Castro AM**, Smith TB, Snyder GA, Brandtneris V, van Hooidek R, Maté JL, Manzello D, Glynn PW, Fong P, Baker AC (2023) Increased dominance of heat-tolerant symbionts create resilient coral reefs in near-term ocean warming. *PNAS*. doi:10.1073/pnas.2202388120
11. Johnston MA, Studivan MS, Enochs IC, Correa AMS, Besemer N, Eckert RJ, Edwards K, Hannum R, Hu X, Nuttall M, O'Connell K, **Palacio-Castro AM**, Schmahl GP, Sturm AB, Ushijima B, Voss JD (2023) Coral disease outbreak at the remote Flower Garden Banks, Gulf of Mexico. *Frontiers in Marine Science*. doi:10.3389/fmars.2023.1111749
12. **Palacio-Castro AM**, Rosales SM, Dennison CE, Baker AC (2022) Microbiome signatures in *Acropora cervicornis* are associated with genotypic resistance to elevated nutrients and heat stress. *Coral Reefs*. doi:10.1007/s00338-022-02289-w
13. **Palacio-Castro AM**, Dennison CE, Rosales SM, Baker AC (2021) Variation in susceptibility among three Caribbean coral species and their algal symbionts indicates the threatened staghorn coral, *Acropora cervicornis*, is particularly susceptible to elevated nutrients and heat stress. *Coral Reefs*. doi:10.1007/s00338-021-02159-x
14. Fuess LE, **Palacio-Castro AM**, Butler CC, Baker AC, Mydlarz LD (2020) Increased algal symbiont density reduces host immunity in a threatened Caribbean coral species, *Orbicella faveolata*. *Frontiers in Ecology and Evolution*. doi:10.3389/fevo.2020.572942
15. Romero-Torres M, Acosta A, **Palacio-Castro AM**, Treml EA, Zapata F, Paz-García D, Porter JM (2020) Coral reef resilience to thermal stress in the eastern tropical Pacific. *Glob Change Biol*. doi:10.1111/gcb.15126
16. Towle EK, **Palacio-Castro AM**, Baker AC, Langdon C (2017) Source location and food availability determine the growth response of *Orbicella faveolata* to climate change stressors. *Regional Studies in Marine Science*

Book Chapters

1. **Palacio-Castro AM**, Zapata FA (2023) Comparación de métodos para el estudio y monitoreo de arrecifes coralinos. In: JA Sánchez, EM Alvarado, LF Barrios & E Ochoa (Ed.). Manual de procedimientos y metodologías para buceo científico. Academia Colombiana de Ciencias Exactas, Físicas y Naturales (ACCEFYN), Bogotá, Colombia. ISBN 978-626-95506-9-6

FIRST-AUTHOR PRESENTATIONS

- 2024 Oral presentation. *Reef Futures 2024*, Riviera Maya, Mexico.
- 2024 Oral presentation. *ReefFlorida Symposium 2024*, Miami, USA.
- 2022 Oral presentation. *Reef Futures 2022*, Key Largo, USA.
- 2022 Oral presentation. *5th Symposium on the Ocean in a High-CO2 World*, Lima, Perú.
- 2022 Oral presentation. *15th International Coral Reef Symposium (ICRS)*, Bremen, Germany.
- 2021 Oral presentation. *14th International Coral Reef Symposium (ICRS)*, Bremen, Germany (Online).
- 2018 Oral presentation. *Reef Futures 2018*, Key Largo, USA.
- 2018 Oral presentation. *Colombia 2018: International Conference on Marine Science*, Medellín, Colombia.
- 2016 Oral presentation. *13th International Coral Reef Symposium (ICRS)*, Honolulu, USA.
- 2013 Oral presentation. *7th Mexican and 1st Pan-American Coral Reef Congress*, Mérida, Mexico.
- 2010 Oral presentation. *XIX National Seminar on Science and Technology of the Sea (SENALMAR)*, Cali, Colombia.

TECHNICAL REPORTS

- 2010 Zapata FA, **Palacio-Castro AM**, Jaramillo-G J, Palacios MM, Londoño E, Izquierdo V, Muñoz CG, Lemos I, Zambrano V, Lozano D. *Comparison of different methods used for assessing the status of coral reefs in the Tropical Eastern Pacific Seascape and preliminary analysis of the resilience of coral reefs within Gorgona Island National Natural Park (Colombia)*. Report to Conservation International-Colombia.
- 2010 Navas-Camacho R, Jaramillo-González J, Vega-Sequeda JC, Lozano-Cortés D, Zapata FA, **Palacio-Castro AM**, Palacios MM, Muñoz CG. *Informe de la expedición científica Gorgona 2009. Capítulo V Monitoreo de arrecifes coralinos en estaciones del Sistema Nacional de Monitoreo de Arrecifes Coralinos en Colombia – SIMAC*. Informe técnico a Conservación Internacional y PNN Gorgona.
- 2008 **Palacio-Castro AM**, Rodríguez-Ramírez A, Muñoz CG, Zapata FA. *Evaluación base de la biodiversidad marina del Parque Nacional Natural Gorgona. Capítulo III: Corales*. Corredor marino de conservación del Pacífico Este Tropical. Informe proyecto Conservación Internacional – Fundación Yubarta. 40p.

RESEARCH EXPEDITIONS

- Gulf of Panama and Chiriquí - Panama (2014, 2015, 2016, 2018, 2025).
- Dry Tortugas – USA (2024)
- Flower Garden Banks - USA (2022)
- The Galapagos Islands - Ecuador (2015, 2017).
- Gorgona Island - Colombia (2009, 2014).
- Malpelo Island - Colombia (2010)

TEACHING EXPERIENCE

- 2018 **Guest Lecturer:** Universidad CES. Class: *Corales en el antropoceno: Efectos del calentamiento climático en los corales pétreos*.
- 2016 **Guest Lecturer:** University of Miami - MBE 535/ 635: Practical Computing for Biologists. Lecture: *Version control and reproducible science*.
- 2016 **Teaching assistant:** University of Miami – Study abroad program. MSC422: Marine Ecology of The Galapagos.
- 2015 **Teaching assistant:** University of Miami, MSC232: Introduction to Marine Biology Laboratory

MENTORSHIP

Student committees (Degree, year of graduation)

1. Kenzie Cook (Co-advisor, PhD, University of Miami, expected 2029)
2. Carmen Hoffman (Co-advisor, MPS, University of Miami, expected 2026)
3. Veronica Paul (Co-advisor, MPS, University of Miami, expected 2026)
4. Savannah Hewson (Co-advisor, MPS, University of Miami, 2025)
5. Kenzie Cook (Thesis co-chair, BS, University of Miami, 2024)
6. Zach Zagon (Co-advisor, MPS, University of Miami, 2023)
7. Danielle Kroesche (Co-advisor, MPS, University of Miami, 2021)
8. Elizabeth Quiceno (Thesis co-chair, BS, Universidad de Antioquia, 2020)

Research mentorship (Affiliation):

Postdoctoral researchers (3):

1. 2025 Jenny Mallon (Smith Conservation Fellow)
2. 2024-2025 Emma Pontes (CIMAS/AOML)
3. 2024-2025 Bradley Weiler (CIMAS/AOML)

Master students (4):

1. 2023 Zach Zagon (MPS, University of Miami)
2. 2019-2021 Danielle Kroesche (MPS, University of Miami)
3. 2015 Marine-Océane Guillemard (MS, Pierre and Marie Curie University)
4. 2015 Julienne Beblo (MPS, University of Miami)

Undergraduate students (12):

1. 2025: Nicole Kobasa (NOAA Hollings Scholar)
2. 2024: Corinne Renshaw (NOAA Hollings Scholar)
3. 2023-2024: Kenzie Cooke (University of Miami)
4. 2017 - 2018 Sofia Diaz de Villegas (Wellesley College)
5. 2017: Celia Leto (University of Miami)
6. 2016 - 2017: Prati Rosen (University of Miami)
7. 2016 - 2017: Rebecca Gilpin (University of Miami)
8. 2015 – 2018: Caroline Dennison (University of Miami)
9. 2016: Karim Primov (University of Miami)
10. 2015: Elana Rusnak (University of Miami)
11. 2014 - 2016: Grace Snyder (University of Miami)
12. 2014: Patrick Nichol (University of Miami)

High school students

1. 2014-2017: Hannah Waxman (MAST Academy)

REVIEWER ACTIVITIES

Journal reviewer: Global Change Biology, PeerJ, Ecology, Marine Ecology, Biodiversity and Conservation, PLOS One, Scientific Reports, Coral Reefs, Climatic Change, Aquatic Sciences.

Grant reviewer: NSF Ocean Sciences Postdoctoral Research Fellowships.

Dissertation reviewer (Degree, year): University of the Philippines (MS., 2025), University of Melbourne (PhD., 2024), University of Bremen (PhD., 2023), Universidad de Antioquia (MS., 2003, 2024), Universidad del Valle (MS., 2024), Universidad de la Amazonia (BS., 2023)

PROFESSIONAL SERVICE ACTIVITIES

2022-2024 Steering committee of the NOAA-Miami early career and inclusion affinity group.

OUTREACH AND SCIENCE COMMUNICATION

Presentations:

- 2024 AOML Coral Program's contribution to OA monitoring and research. 1st Caribbean Coastal Acidification Network (Cari-CAN) Workshop. Puerto Rico, November 13, 2024
- 2017 3rd Coral Reef Ecology Workshop (CREWS). Instructor of *Coral Biology*, *Bonaire's coral reefs*, and *Ocean Conservation*. Bonaire, September 24-29.
- 2016 *Coral reefs in Panama*. Presentation for the elementary school in Pixvae - Gulf of Chiriquí, Panama. April 20
- 2016 *El Niño effects on Galápagos marine ecosystems*. Presentation for the Park Rangers in the Galápagos National Park. February 12
- 2016 *El Niño effects on Galapagos marine ecosystems*. Workshop for the community (Familias Campesinas) in cooperation with IOI-Galapagos. February 11
- 2015 1st Coral Reef Ecology Workshop (CREWS). Instructor of *Coral Biology* and *Symbiosis in Coral Reefs*. Cozumel, Mexico, November 7-14.

Online:

- 2024 "Meet the women advancing NOAA's marine heatwave research"
- 2023 "Celebrating Women's History Month with Ana Palacio"

Radio interviews:

- 2017 "*Blanqueamiento coralino: Una amenaza inminente para el planeta*" in *Noticias ONU*, January 6th

Print media:

- 2015 "*Research heats-up / Se calienta la investigación*" in *TRÓPICOS*, September.

Videos:

- 2014 "*Coral rescue at Port of Miami*" on YouTube, June 6th.
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SKILLS AND CERTIFICATIONS

Diving and boating (Agency, Year)

- American Academy of Underwater Sciences (AAUS) 100ft scientific diver (2013-2025) - 400+ dives
- Enriched Air – Nitrox (TDI, 2022, 1293906)
- AWARE coral reef conservation (PADI, 2015, 15110U4056)
- First aid for professional divers (DAN, 2014-2025)
- Small motor boats (MOCC - US Geological Survey, 2013)
- Advanced open water diver (PADI, 2009)

Software: Unix/Linux, statistics and database design (R, Python); spatial analysis (ArcGIS); image analysis (ImageJ, CPCE), figure preparation (GIMP, Inkscape)

Languages: Spanish (Native), English (Proficient)
