ANA M. PALACIO-CASTRO

CIMAS Associate Scientist at NOAA-AOML
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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 Associate Scientist at the Cooperative Institute for Marine and Atmospheric Studies (CIMAS) and NOAA's Atlantic Oceanographic and Meteorological Laboratory (AOML). My research examines how ocean warming, acidification, diseases, and land-based sources of pollution affect corals, disrupting the coral-algal symbiosis and 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, and I apply these findings to support coral restoration and reef management.

PROFESSIONAL EXPERIENCE

Associate Scientist – UM-CIMAS, NOAA-AOML *2025–present*

- Co-lead a multidisciplinary team of 15–18 members across Coral Program projects and provide strategic direction for project prioritization, planning, and execution.
- Lead and co-lead externally funded projects (NOAA, FDEP, NFWF, NATO, CORDAP), including budgeting, field work, and coordination across institutions.
- Oversee laboratory and field-based research on coral health, stress tolerance and restoration.
- Mentor Ph.D. students and postdoctoral researchers.

Assistant Scientist – UM-CIMAS, NOAA-AOML *2023-2025*

- Designed and conducted laboratory experiments on the physiological and molecular responses of corals to multiple stressors.
- Managed funded projects, including budgeting, planning, and field work.
- Supervised and mentored master's and undergraduate students.

Postdoctoral Researcher – UM-CIMAS, NOAA-AOML *2022-2023*

- Synthesized more than a decade of data from the Florida Keys to assess long-term trends in ocean acidification.
- Led laboratory experiments on how temperature and nutrient enrichment affect stony coral tissue loss disease.
- Co-led the integration of robotic systems to increase experimental capacity in a wet lab facility.
- Secured research funding as PI on NOAA and FDEP grants.
- Published peer-reviewed articles and presented at international conferences.

Postdoctoral Fellow - National Research Council *2019-2021*

- Designed and led experiments on the role of nutrient enrichment in white band disease progression in corals.
- Mentored a master's student in experimental design, data analysis, and scientific writing.
- Published peer-reviewed articles and presented findings at an international conference.

Graduate Research Assistant – University of Miami (UM) - RSMAS *2013-2018*

GRANTS AND FELLOWSHIPS ($7,144,447)

$5,332,565 as PI; $1,383,414 as co-PI; $99,968 as senior personnel; $328,500 in fellowships and scholarships

2027–2029 NFWF: An algal symbiont culture library to scale up the production of resilient coral recruits across Florida's reef restoration practitioners (Co-PI – $299,999)
2027–2028 NATO: Planning for hybrid coral and engineered systems to protect critical infrastructure in San Andres, Colombia (Co-PI – $497,201)
2026–2027 CORDAP CLIP 2025: Unraveling the mechanisms behind temperature tolerance in Eastern Tropical Pacific corals (Senior personnel – $99,968)
2026–2027 Florida Department of Environmental Protection (FDEP): Developing automated technologies for ex situ coral propagation (Co-PI – $288,824)
2025–2028 NOAA: Evaluating and enhancing coral reefs' persistence and restoration: Integrative approaches for adaptation and management (PI – $265,641)
2025–2026 FDEP: Automated technologies for ex situ coral propagation (Co-PI – $297,390)
2025 NOAA OAR Omics Grant: SCTLD environmental co-factors (PI – $120,229)
2023–2027 NOAA National Ocean Service (NOS): Characterizing and forecasting coastal ecosystem responses to multiple stressors for management applications in South Florida (PI – $4,080,792)
2023–2024 FDEP: High-replication assessment of the effects of poor water quality on South Florida coral health and susceptibility to Stony Coral Tissue Loss Disease (PI – $380,553)
2022–2024 NOAA OAR Omics Grant: SCTLD environmental co-factors (PI – $340,000)
2022–2023 FDEP: Assessing the effects of environmental co-factors on SCTLD transmission and progression rates (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)

AWARDS

2026 CIMAS Cash-In-A-Flash Award: honorable mention for "AOML Outstanding Paper Awards"
2026 CIMAS Peer Award: support during shutdown
2025 CIMAS: Cash-In-A-Flash Award
2024 CIMAS: Cash-In-A-Flash Award
2023 NOAA OAR: Team Member of the Year
2023 CIMAS Team Member of the Year: outreach and educational activities, in responding to the unexpected and unprecedented 2023 coral bleaching event in South Florida
2023 NOAA AOML: Andrew Award
2003 Colombian Presidency: High School Mario Galán Gómez distinction
2002 Medellín City Hall: Best High School Graduate of Antioquia

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PUBLICATIONS

Refereed Journal Articles (23; 6 as first author)

1. Morris JT, Hirsh HK, Gill TJ, Webb A, Takeshita Y, **Palacio-Castro AM**, et al. (2026). Dissolution and heterotrophy prevail at a Florida coral reef one year after sublethal bleaching. *JGR: Oceans.* doi: 10.1029/2026JC024333
2. Rosales SM, **Palacio-Castro AM**, Enochs IC, Kroesche D (2026) Genotype-specific microbiome responses of *Acropora cervicornis* to nutrient enrichment and disease stress reveal candidate taxa linked to health. BMC Mar. Sci. 1, 5. doi: 10.1186/s44479-026-00005-0
3. Gill TJ, Jankulak M, Osborne J, Kiel PM, **Palacio-Castro AM**, Enochs IC (2026) Real-time acidification monitoring through Sofar buoy and SAMI-pH integration. *HardwareX.* doi: 10.1016/j.ohx.2026.e00772
4. Cooke KM, **Palacio-Castro AM,** Boyd A, et al. (2026) Alkalinity enrichment stimulates calcification and linear extension in *Acropora cervicornis*. *Scientific Reports* doi: 10.1038/s41598-026-44817-6

5. Connelly MT, Glynn VM, Cornejo A, Villalobos-Cubero T, Kleypas J, Alvarado JJ, Brandt M, Logan CA, **Palacio-Castro AM**, Flot J-F, Leray M, Connolly SR, Quattrini AM (2026) Genome Skimming Illuminates Hidden Species Diversity and Symbiodiniaceae Associations in East Pacific *Pocillopora* Corals. *Genome Biology and Evolution*. doi: 10.1093/gbe/evaf235
6. Jiang, L-Q, Fay A, Müller JD., Keppler L, Carroll D, et al. (2026) Synthesis of data products for ocean carbonate chemistry, Earth System Science Data. doi: 10.5194/essd-18-1405-2026
7. **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
8. **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
9. 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. *Limnology and Oceanography: Methods*. doi:10.1002/lom3.70000
10. 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
11. DeMerlis A, Studivan MS, Wong K, et al. (2025) Differences in molecular responses to a thermally variable preconditioning treatment for two Caribbean coral species. *Ecology and Evolution* doi: 10.1002/ece3.72108.
12. 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
13. 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. *Global Change Biology*. doi:10.1111/gcb.17371
14. 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
15. **Palacio-Castro AM**, Enochs IC, Besemer N, Boyd A, Jankulak M, Kołodziej G, Hirsh HK, Webb AE, Towle EK, Kelble C, Smith I, Manzello DP (2023) Coral reef carbonate chemistry reveals interannual, seasonal, and spatial impacts on ocean acidification off Florida. *Global Biogeochemical Cycles*. doi:10.1029/2023GB007789
16. 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
17. **Palacio-Castro AM**, Smith TB, Snyder GA, Brandtneris V, van Hooidonk 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
18. 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
19. **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
20. **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
21. 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
22. Romero-Torres M, Acosta A, **Palacio-Castro AM**, Treml EA, Zapata F, Paz-García D, Porter JW (2020) Coral reef resilience to thermal stress in the eastern tropical Pacific. *Global Change Biology*. doi:10.1111/gcb.15126
23. 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.* doi:10.1016/j.rsma.2017.01.007

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

Journal Articles in Review

1. Enochs IC, Studivan MS, Holstein DM, Layagala K, **Palacio-Castro AM**, et al. (submitted to Science Advances). Pacific coral species are susceptible to stony coral tissue loss disease.
2. Lewis DM, Grove LJW, Ernest SKM, Enochs IC, **Palacio-Castro AM**, et al. (submitted to Global Change Biology). Depth and habitat complexity preserve species richness but do not prevent degraded coral reef communities from thermally driven restructuring.

FIRST-AUTHOR PRESENTATIONS

2026 Poster. *16th International Coral Reef Symposium (ICRS)*, Auckland, New Zealand.
2024 Oral presentation. *Reef Futures 2024*, Riviera Maya, México.
2024 Oral presentation. *ReeFLorida 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

2024 **Palacio-Castro AM**, Studivan MS, Enochs IC. *High-replication assessment of the effects of poor water quality on South Florida coral health and susceptibility to Stony Coral Tissue Loss Disease*. Florida Department of Environmental Protection, Dania Beach, FL. 24 pp.

2023 **Palacio-Castro AM**, Studivan MS, Enochs IC. *Assessing the effects of environmental cofactors on Stony Coral Tissue Loss Disease (SCTLD) transmission and progression rates.* Florida Department of Environmental Protection. Miami, FL. 19 pp.

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, 2026).
- Malpelo Island - Colombia (2010)

TEACHING EXPERIENCE

2018 **Guest Lecturer:** Universidad CES. Lecture: *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

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MENTORSHIP

Student committees (Degree, year of graduation)

1. Kenzie Cooke (Co-advisor, PhD, University of Miami, expected 2029)
2. Carmen Hoffman (Co-advisor, MPS, University of Miami, 2026)
3. Veronica Paul (Co-advisor, MPS, University of Miami, 2026)
4. Savannah Hewson (Co-advisor, MPS, University of Miami, 2025)
5. Kenzie Cooke (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:

1. 2025-2026 Dr. Jenny Mallon (Smith Conservation Fellow)
2. 2024-2026 Dr. Emma Pontes (CIMAS/AOML)
3. 2024-2026 Dr. Richard Karp (CIMAS/AOML)
4. 2024-2026 Dr. Bradley Weiler (CIMAS/AOML)
5. 2024-2026 Dr. John Morris (CIMAS/AOML)

Master students:

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 Université)
4. 2015 Juliene Beblo (MPS, University of Miami)

Interns:

1. 2024-2025 Emilia Silverberg (Coral Program Internship)
2. 2024-2025 Ashley Stevens (Coral Program Internship)

Undergraduate students:

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) 2026-2027: Mathilda Erdbrink Johnson (Sleepy Hollow High School)
2) 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., 2023, 2024), Universidad del Valle (MS., 2024), Universidad de la Amazonia (BS., 2023)

PROFESSIONAL SERVICE ACTIVITIES

Feb 2026 – present:	Southeast Florida Coral Reef Initiative (SEFCRI) NOAA Team Member
Oct 2026 – present:	Review Editor, Frontiers in Ecology and Evolution (Long-Term Field Monitoring)
Oct 2025 – present	University of Miami Frost Institute for Data Science and Computing
2022 – 2024	Steering committee of the NOAA-Miami early career and inclusion affinity group

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OUTREACH AND SCIENCE COMMUNICATION

Presentations:

2025 Rosenstiel School Climate Café Series "*The Future of Florida's Coral Reef: New Approaches for Rebuilding Resilience*"
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

SKILLS AND CERTIFICATIONS

Diving and boating (Agency, Year)

1) American Academy of Underwater Sciences (AAUS) 100ft scientific diver (2013-current) - 400+ dives
2) Enriched Air – Nitrox (TDI, 2022, 1293906)
3) AWARE coral reef conservation (PADI, 2015, 15110U4056)
4) First aid for professional divers (DAN, 2014-current)
5) Small motorboats (MOCC – US Geological Survey, 2013)
6) 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)
