COLIN J. ANTHONY

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ResearchGate · Google Scholar · researchmap

Education

2024 – 2027 **Doctor of Philosophy** · *Integrated Biosciences*
The University of Tokyo (東京大学) · Graduate School of Frontier Sciences · Japan

2020 – 2023 **Master of Science** · *Biology*
University of Guam (Unibetsedåt Guåhan) · Marine Laboratory · Guam

2016 – 2020 **Bachelor of Science** · *Biology & Writing*
Northwest Missouri State University · United States

Research Positions

2024 – **Doctoral Fellow**
The University of Tokyo · Graduate School of Frontier Sciences · Japan
Funded through the JSPS DC1 Fellowship ('25/4 – '28/3) and University of Tokyo Fellowship ('24/10 – '25/3).

Challenging fundamental biological assumptions, describing novel endosymbiotic relationships, and revealing hidden nutrient interactions that explain how marine photo-symbiosis supports ecosystem level processes.

2025 – 2026 **Research Community Coordinator**
Georgetown University · Earth Commons Institute · Remote

Coordinate a global scientific community focused on the ecosystems at the ocean's surface (https://goseascience.org/) as complimentary support for my community science and open ocean focused research (Anthony et al. 2024 *Current Biology;* Church et al. 2025 *Current Biology*).

2023 – 2024 **Research Associate**
University of Guam · Marine Laboratory · Guam
Funded through National Fish and Wildlife Foundation (NFWF) and Sea Grant.

Developed coral restoration and monitoring frameworks that simultaneously progressed basic and applied biology to keep up with climate change (Anthony et al. 2025 *One Earth*).

2020 – 2023 **Graduate Research Assistant**
University of Guam · Marine Laboratory · Guam
Funded through the National Science Foundation: NSF Guam EPSCoR.

Researched the relationship between phenotype and the marine environment, with specific attention towards the development of phenotypic traits as bioindicators (Anthony et al. 2023 *PLoS One;* 2024 *Marine Pollution Bulletin*).

Publications

Lead author publications: 10 | Mean IF: 4.6 (all), 8.9 (2025) *corresponding author **mentee

15. Aoki R, Nishihara H, Sakamoto T, … **Anthony CJ,** … Matsunaga S. Algal-mammal cell fusion facilitates chromosome transfer through genomic hitchhiking. [To be submitted]

14. Lock C*, Miller T, **Anthony CJ,** Rouzé H, Fifer J, McDermott G, Tramonte CA, Paulino Jr L**, Davies SW, Raymundo LJ, Bentlage B. (2025). Symbiodiniaceae and bacterial microbiome dynamics differentially impact the survival of dominant reef-flat *Porites* corals. *Environmental Microbiology*. 27, e70175. https://doi.org/10.1111/1462-2920.70175

13. Wagner MA*, Wang Z, **Anthony CJ,** Rivera E, Strader ME. (2025). iNaturalist data suggests a recent northward expansion of the upside-down jellyfish, *Cassiopea*. *Science of the Total Environment*. 992, 179948. https://doi.org/10.1016/j.scitotenv.2025.179948

12. Church S*, Abedon RB, Ahuja N, **Anthony CJ,** … Dunn CW. (2025). Population genomics of a sailing siphonophore reveals genetic structure in the open ocean. *Current Biology.* 35, 1-14. https://doi.org/10.1016/j.cub.2025.05.066

11. **Anthony CJ***, Lemer S, Raymundo LJ, Rouzé H*. (2025). Restoration innovation: Fusing microbial memories to engineer coral resilience. *One Earth*. 8, 101193. https://doi.org/10.1016/j.oneear.2025.101193

    In brief. We propose a scalable technique to build flexibility into individual colonies by fusing clonal corals that have been acclimated to, or raised in, different environments by utilizing the rapid growth, increased survival, and diversified toolkit associated with coral fragmentation, fusion, and microbiomes. This is the first attempt to conceptually integrate coral microbiology, restoration, and fusion into a technique capable of maximizing coral resilience and restoration scalability.

10. **Anthony CJ***, Lock C, Pérez-Rosales G, Rouzé H, Paulino Jr L**, Raymundo LJ, Bentlage B. (2024). Symbiodiniaceae phenotypic traits as bioindicators of acclimatization after coral transplantation. *Marine Pollution Bulletin*, 209, 117250. https://doi.org/10.1016/j.marpolbul.2024.117250

    In brief. This was a foundational attempt to develop phenotypic traits of photo-endosymbionts as coral stress bioindicators. Using a personally developed flow cytometry protocol [1.3] we discovered two things. 1) Symbiodiniaceae cells increase in roughness after transplantation. 2) Coral paling does not necessarily reflect the Symbiodiniaceae assemblage.

9. Salas R**, **Anthony CJ***, Bentlage B. (2024). Light exposure induces phenotypic plasticity of the upside-down jellyfish *Cassiopea* sp. and its endosymbiotic dinoflagellates. *Journal of Experimental Marine Biology and Ecology*, 581, 152068. https://doi.org/10.1016/j.jembe.2024.152068

8. Morejón-Arrojo RD*, **Anthony CJ**, Rodríguez-Viera L. (2024). Asymmetrical bleaching of upside-down jellyfish *Cassiopea* during high water temperatures in Cuba. *Marine Biodiversity,* 54, 41. https://doi.org/10.1007/s12526-024-01434-8

7. **Anthony CJ**, Bentlage B, Helm RR*. (2024). Animal evolution at the ocean's water-air interface. *Current Biology*, 34, 196-203. https://doi.org/10.1016/j.cub.2023.11.013

    In brief. We tested a 66-year-old assumption that animals living on the ocean's surface evolved from seafloor ancestors. Ancestral reconstructions revealed that surface animals largely evolved from substrate-attached ancestors, although not necessarily from the seafloor. This transition was likely facilitated by modifications of attachment structures.

6. **Anthony CJ***. (2024). Beachside banquet: Ants' appetite for shipwrecked siphonophores. *Food Webs,* 38, e00332. https://doi.org/10.1016/j.fooweb.2023.e00332

5. **Anthony CJ***, McDermott G, Lock C, Miller T, Bentlage B, Raymundo LJ. (2024). Depth independent phenotypic variation of massive *Porites* coral color morphs. *Marine Ecology,* 45, e12788. https://doi.org/10.1111/maec.12788

4. **Anthony CJ***, Lock C, Taylor BM, Bentlage B. (2023). Cellular plasticity facilitates phenotypic change in a dominant coral's Symbiodiniaceae assemblage. *Frontiers in Ecology and Evolution,* 11, 1288596. https://doi.org/10.3389/fevo.2023.1288596

3. **Anthony CJ***, Lock C, Bentlage B. (2023). Rapid, high-throughput phenotypic profiling of endosymbiotic dinoflagellates (Symbiodiniaceae) using benchtop flow cytometry. *PLoS One*, 18, e0290649. https://doi.org/10.1371/journal.pone.0290649

    In brief. We developed a protocol that collects information on cell autofluorescence, shape, and size to simultaneously generate phenotypic profiles for thousands of Symbiodiniaceae cells, thus revealing phenotypic variance of the Symbiodiniaceae assemblage to the resolution of single cells. Integration of our protocol into existing workflows allows researchers to acquire a new level of resolution for studies examining the acclimation and adaptation strategies of Symbiodiniaceae assemblages. I have applied this method to multiple studies since its initial conceptualization [4, 9, 10].

2. **Anthony CJ***, Tan KC**, Pitt K, Bentlage B, Ames CL. (2023). Leveraging public data to predict global niches and distributions of rhizostome jellyfishes. *Animals,* 13, 1591. https://doi.org/10.3390/ani13101591

1. **Anthony CJ**, Heagy M, Bentlage B*. (2022). Phenotypic plasticity in *Cassiopea ornata* (Cnidaria: Scyphozoa: Rhizostomeae) suggests environmentally driven morphology. *Zoomorphology,* 141, 115–131. https://doi.org/10.1007/s00435-022-00558-4

Presentations

Presenting author presentations: 13

28. Genot B, **Anthony CJ**, Maruyama S. (2025, June 9). Photosynthesis ubiquity: From early diverging protists to complex photosymbiotic models. *Photosynthesis Ubiquity Conference, Chichibu, Japan*. [Poster]

27. Wagner M, Wang Z, **Anthony CJ**, Rivera E, Strader M. (2025, April 3). Going up? The northward range expansion of the upside-down jellyfish. *Benthics Ecology Meeting*, *Mobile, Alabama, United States*. [Oral]

26. Liu Y, **Anthony CJ**, Genot B, Yamagishi D, Kawano H, Tanifuji N, Mibu S, Maruyama S. (2025, March). Diurnal rhythm in motility of coral symbiont algae. *7th Area Plenary Meeting, Ethological Dynamics in Diorama Environments, Sendai, Japan.* [Poster]

25. **Anthony CJ**, Lemer S, Andersen MD, Raymundo LJ, Rouzé H. (2024, November 30). Sustainable restoration: Leveraging the coral microbiome through culture and microfusion. *27th Annual Meeting of the Japanese Coral Reef Society, Miyazaki, Japan.* [Oral]

24. **Anthony CJ**, Rouzé H. (2024, November 21) Exploring new coral engineering methods to enhance coral reef restoration in Guam. *Sustainable NFWF Coral Reef Virtual Grantee Conference – Pacific.*

23. **Anthony CJ**. (2024, October 18) Integrating phenomics into coral conservation. *University of Guam, POETS Club, Mangilao, Guam.* [Oral]

22. Ariellius Z**, Respicio B, **Anthony CJ**, Rubin E, De Ramos X, Cablles C, Yang S-H, Rouzé H. (2024, July 4). Functional diversity of complex symbiotic networks: Effects of eutrophication on Guam's key scleractinian corals. *European Coral Reef Symposium – ECRS 2024, Naples, Italy.* [Poster]

21. Wagner M, **Anthony CJ**, Wang Z, Rivera E, Strader M. (2024, May 10-12). Range expansion of *Cassiopea* along the Florida coast. *7th International Cassiopea Workshop, Key Largo, Florida, United States.* [Oral]

20. Wang Z, **Anthony CJ**, Strader M. (2024, May 10-12). *Cassiopea* as a model to study organism-environment interactions in response to global change. *7th International Cassiopea Workshop, Key Largo, Florida, United States.* [Oral]

19. **Anthony CJ**, Lemer S, Anderson MD, Raymundo LJ, Rouzé H. (2024, April 12). Small solutions for big problems: Engineering resilient reefs with coral microbiomes, microfragmentation, and microfusion. *15th UoG Conference on Island Sustainability, Tumon, Guam.* [Oral]

18. Ariellius Z**, Respicio B, **Anthony CJ**, De Ramos X, Cablles C, Yang S-H, Rouzé H. (2024, April 12). Functional diversity of complex symbiotic networks: Effects of eutrophication on Guam's key scleractinian corals. *15th UoG Conference on Island Sustainability, Tumon, Guam.* [Oral]

17. Rouzé H, Lemer S, **Anthony CJ**, Fujimura A. (2024, April 8). Assessing and predicting eutrophication's effect on coral health with remote sensing and coral holobiont biomarkers. *3rd Annual NASA Guam Research Symposium, 15th UoG Conference on Island Sustainability, Tumon, Guam.* [Oral]

16. Wang Z, **Anthony CJ**, Lloyd E, Rivera E, Harper K, Hendricks S, Strader M. (2023, October 8). *Cassiopea* as a model study organism: Environment interactions in response to global change. *Jelly Camp, National Aquarium, Baltimore, Maryland, United States.* [Poster]

15. **Anthony CJ**, Lock C, Salas R**, Bentlage B. (2023, June 22). Multiscale characterization of the Symbiodiniaceae assemblage during in situ acclimation. 5th *Asia-Pacific Coral Reef Symposium, Singapore.* [Oral]

14. Lock C, Miller T, **Anthony CJ**, Rouze H, Fifer J, McDermott G, Tramonte C, Davies S, Raymundo LJ, Bentlage B. (2023, June 20). Holobiont transplantation dynamics in two dominant reef building coral species and their color morphs. 5th *Asia-Pacific Coral Reef Symposium, Singapore.* [Oral]

13. **Anthony CJ**. (2023, June 14). Building macroecological and macroevolutionary hypotheses from publicly available data. *Tohoku University, Sendai, Japan.* [Oral]

12. **Anthony CJ**, Tan KC**, Pitt K, Bentlage B, Ames CL. (2023, May 12). Mitigating biases from citizen-derived data to model jellyfish niches and distributions. 6th *International Cassiopea Workshop and Conference, Miami, Florida, United States.* [Oral]

11. **Anthony CJ**, Helm RR, Ames CL, Tan KC**, Pitt K, Heagy M, Schaeffer A, Bentlage B. (2023, April 18). Publicly available data can reveal broad ecological and evolutionary trends. *2023 Conference on Island Sustainability, Tumon, Guam.* [Oral]

10. Salas R**, **Anthony CJ**, Bentlage B. (2022, October 28). Light-induced changes in the behavior and photosymbiosis of the upside-down jellyfish. *2022 SACNAS National Diversity in STEM Conference, San Juan, Puerto Rico.* [Poster]

9. **Anthony CJ**. (2022, October 24). Acclimation dynamics of coral-dinoflagellate symbiosis in situ. *Tohoku University – OIST 3rd Joint Workshop on Biodiversity: From Genes and Species to Ecosystem Services and Resilience, Sendai, Japan.* [Oral & Poster]

8. **Anthony CJ**, Bentlage B. (2022, July 6). Autofluorescence of Symbiodiniaceae reveals photophysiological plasticity amidst a changing climate. 15th *International Coral Reef Symposium, Bremen, Germany.* [Poster]

7. Bentlage B, Lock CC, **Anthony CJ**, McDermott G, Miller T, Raymundo LJ. (2022, July 6). Identifying the traits of coral resilience to climate change on Guam's reefs. 15th *International Coral Reef Symposium, Bremen, Germany.* [Poster]

6. **Anthony CJ**. (2022, April 23). Seasonal photosystem acclimation in staghorn coral, *Acropora* cf. *pulchra*. *UoG CNAS STEM Conference, Mangilao, Guam.* [Oral; Awarded "Best Presentation in Marine Science"]

5. Lock C, **Anthony CJ**, Miller T, McDermott G, Tramonte C, Raymundo L, Bentlage B. (2022, April 7). Identifying the traits of coral resilience to climate change on Guam's reefs. *2022 Conference on Island Sustainability, Tumon, Guam.* [Oral]

4. **Anthony CJ**, Heagy M, Bentlage B. (2022, April 6). Morphological plasticity in the upside-down jellyfish, Genus *Cassiopea*, complicates species identification. *2022 Conference on Island Sustainability, Tumon, Guam.* [Poster]

3. Salas R**, **Anthony CJ**, Bentlage B. (2022, April 6) Light and food-induced changes of morphology in the upside-down jellyfish, *Cassiopea ornata*. *2022 Conference on Island Sustainability, Tumon, Guam.* [Poster]

2. Bentlage B, Lock C, **Anthony CJ**, McDermott G, Miller T, Raymundo L. (2022, March 2). Identifying the traits of coral resilience to climate change on Guam's reefs. *Ocean Sciences Meeting, Honolulu, Hawai'i.* [Oral]

1. **Anthony CJ**. (2021, April 16). The Symbiodiniaceae assemblage of Guam's dominant reef flat corals and its implication for coral resilience. *UoG CNAS STEM Conference, Mangilao, Guam.* [Oral]

Lectures, Panels, and Workshops

5. (2025, April 11). Successful applicants share their advice. *Let's Get Ready! JSPS DC1/DC2, Kashiwa, Japan.* [Panelist]

4. (2024, April 13). Professional Skills Panel. *STEM Symposium, 15th UoG Conference on Island Sustainability, Tumon, Guam.* [Panelist]

3. (2022, December 9). An Introduction to Coral Biology. *Introduction to Ecology and Physiology, Tohoku University, Sendai, Japan.* [Lecturer]

2. (2022, December 1). An Introduction to Data Analysis and Figure Design with R. *Applied Marine Biology Program & Graduate School of Agricultural Science, Tohoku University, Sendai, Japan.* [Instructor]

1. (2022, November 17). Present Science Effectively through Balanced Slide Design. *Introduction to Scientific Writing, Tohoku University, Sendai, Japan.* [Lecturer]

Mentorship & Supervision

All students approved their inclusion on this list.

'24/6 – '24/10 **Nicolas Ubaldo, University of Guam** (2nd year) · UoG Marine Lab Research Intern
Effect of nurseries on coral physiology
-Received *More Like Jimmy Scholarship* to pursue marine biology at UoG

'24/1 – '24/10 **Zoe Ariellius, University of Guam** · Graduate Student (M.S.)
Microbial ecology of Guam's dominant reef-building corals
-Presented collaborative work at the *Conference on Island Sustainability* in Tumon, Guam [18] and at the *European Coral Reef Symposium* in Naples, Italy [22]

'22/1 – '23/6 **Rebecca Salas, University of Guam** (2nd year) · NSF SEAS Undergrad Intern · Interview

Behavioral and physiological plasticity of the upside-down jellyfish
-Presented at the *Conference on Island Sustainability* in Tumon, Guam [3]
-Received travel grant to present research at the *SACNAS* conference in Puerto Rico [10]
-Published research in *J. Exp. Mar. Biol. Ecol.* [10]

‘22/1 – ‘23/6 **Loreto Paulino, Jr., University of Guam** (3rd year) · Guam EPSCoR Research Assistant II
Quantifying bleaching in situ for Guam’s dominant reef-building corals
-Accepted an REU at the University of Rhode Island, returned to work for us in Fall 2022
-Received a prestigious research experience in Alaska after his appointment with us
-Published protocol (link) and *Mar. Poll. Bull.* manuscript [11]

‘22/10 – ‘23/5 **Chloe Tan Kei, Tohoku University** (4th year) · Applied Marine Biology Student (B.S.)
Rhizostome jellyfishes: Evolution of stinging cassiosomes and their photo-endosymbionts
-Published collaborative manuscript together [2]
-Pursuing MSc at Tohoku University

‘20/8 – ‘21/5 **Nicholas Camacho, Stanford University** (3rd year) · UoG Marine Lab Research Intern
Evolution of colonial polymorphism in Hydrozoa
-Accepted an REU at the University of Hawai’i at Mānoa

Scholarships & Awards

‘25 JSPS DC1 Fellowship
‘24 The University of Tokyo Fellowship · *Declined from April ‘25*
‘24 SPRING GX Fellowship · *Declined*
‘22 Best Presentation in Marine Science · *UoG CNAS STEM Conference*
‘22 RCUoG Travel Award · *Sendai, Japan*
‘20 Hawai’i Conservation Alliance Conference Student Scholarship
‘17 – ‘20 Distinguished Scholar and Bearcat Advantage Scholarships
‘19 William T. Garrett Zoology Scholarship
‘17 Frank W. Grube English Scholarship
‘16 – ‘20 Presidential & Academic Honor Rolls

Additional Professional Qualifications and Activities

Scientific Diver Certifications: PADI Rescue Diver (2023), AAUS Scientific Diver (2021), Enriched Air Diver (2020)
Research Visits: University of Guam (2025), The University of Tokyo Misaki Marine Biological Station (2025), University of the Ryukyus (2025), University of Tsukuba (2024,2025), Tohoku University (2022,2024)
Journal Reviewer: Coral Reefs, GigaByte, Hydrobiologia, J. Coastal Conservation, J. Experimental Marine Biology and Ecology, PLoS One
Professional Memberships: Japanese Coral Reef Society (2024–), SACNAS (2020–2023), Society for the Study of Evolution (2020–2023), Society of Systematic Biologists (2020-2023), Council of Science Editors (2019-2020)

Media Coverage Highlights

4. They sting, but they're not jellyfish: Scientists study Portuguese man-of-wars and identify four species (translated from Spanish). (2025, July 23). *National Geographic España*.
3. Coral Fusion Teams with Microbiology to Advance Coral Reef Restoration. (2025, May 22). *the microbiologist*.
2. Neuston, We Have a Problem. (2024, June 29). *The Guardian*.
1. Sustainability Conference Ends with Passing of the Eco-Torch. (2024, April 14). *Pacific Daily News*.

References

Shinichiro Maruyama, PhD · Associate Professor · The University of Tokyo
Bastian Bentlage, PhD · Associate Professor of Bioinformatics · University of Guam
Héloïse Rouzé, PhD · Researcher · French National Research Institute for Sustainable Development
Rebecca Helm, PhD · Assistant Professor · Georgetown University
Cheryl Ames, PhD · Professor of Applied Marine Biology · Tohoku University