

RYAN J. ECKERT, PH.D.

Coral reef ecology, mesophotic coral ecosystems, molecular ecology



EDUCATION

- 2025 | 2019**
● **Ph.D. Candidate in Integrative Biology**
Florida Atlantic University
Dissertation: Population genetics of shallow and mesophotic corals and sponges in Florida and the Gulf of Mexico
Advisor: Dr. Joshua Voss
Boca Raton, FL
- 2019 | 2017**
● **M.Sc. in Biological Sciences**
Florida Atlantic University
Thesis: Population genetics and algal symbiont communities of the coral species *Montastraea cavernosa* on the Belize Barrier Reef
Advisor: Dr. Joshua Voss
Boca Raton, FL
- 2009 | 2005**
● **B.Sc. in Biological Sciences**
Florida State University
Thesis: Associational resistance and susceptibility in *Solanum carolinense*
Advisor: Dr. Nora Underwood
Tallahassee, FL

RESEARCH EXPERIENCE

- Present | 2017**
● **Graduate Research Assistant**
FAU, Harbor Branch Oceanographic Institute
Coral Reef Health and Molecular Ecology Lab
Fort Pierce, FL
- 2017 | 2009**
● **Research Specialist**
NOAA's Flower Garden Banks NMS
Science Division
Galveston, TX
- 2009 | 2007**
● **Research Assistant**
Florida State University
Underwood Lab
Tallahassee, FL

TEACHING EXPERIENCE

- 2022**
● **Graduate Teaching Assistant / Lecturer**
FAU / FIO
FIO Summer Marine Field Studies
Long Key, FL
- 2017**
● **Graduate Teaching Assistant**
FAU, Harbor Branch Oceanographic Institute
Marine Biodiversity
Fort Pierce, FL
- 2014 | 2013**
● **Guest Lecturer**
Texas A&M University at Galveston
Scientific Diving Field Survey Methods
Galveston, TX

CONTACT

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cnidaryan.bsky.social
RyanEckert
Ryan J Eckert

SKILLS

Coral reef ecology
Technical SCUBA diving
Closed-circuit rebreather diving
1000+ Scientific Dives
500+ days at sea
100+ research expeditions
Multivariate data analysis
NGS library prep
Bioinformatic analyses

LANGUAGE SKILLS

R
Bash
Python

2010



Instructor

Galveston Independent School District
21st Century ACE

📍 Galveston, TX



STUDENTS MENTORED

2018



Emily Chei

Link fellowship intern

Assessing population connectivity of the coral *Montastraea cavernosa* along the northern Florida Reef Tract

Presently a Ph.D. student at The University of Hong Kong

2017



Ashley Reaume

Link fellowship intern

Optimized extraction and amplification of algal symbiont DNA from TRIzol preserved corals

Presently a Ph.D. student at The University of Central Florida



REFEREED PUBLICATIONS

2024



24. Recent trends and biases in mesophotic ecosystem research

Biol Lett (2024). doi: [10.1098/rsbl.2024.0465](https://doi.org/10.1098/rsbl.2024.0465)

Radice VZ, Hernandez-Agreda A, Pérez-Rosales G, Booker R, Bellworthy J, Broadribb M, Carpenter GE, Diaz C, Eckert RJ, Foster NL, Gijsbers JC, Gress E, Laverick JH, Micaroni V, Pierotti M, Rouzé H, Stevenson A, Sturm AB, Bongaerts P

2024



23. Assessment of nutrient amendments on stony coral tissue loss disease in Southeast Florida

Front Mar Sci (2024). doi: [10.3389/fmars.2024.1384534](https://doi.org/10.3389/fmars.2024.1384534)

Carreiro AM, Eckert RJ, Sturm AB, Ingalls TC, Combs IR, Walker BK, Voss JD

2024



22. Cryptic diversity of shallow and mesophotic *Stephanocoenia intersepta* corals across Florida Keys National Marine Sanctuary

Heredity (2024). doi:[10.1038/s41437-024-00698-x](https://doi.org/10.1038/s41437-024-00698-x)

Eckert RJ, Sturm AB, Carreiro AM, Klein AM, Voss JD

2024



21. Algal symbiont genera but not coral host genotypes correlate to stony coral tissue loss disease susceptibility among *Orbicella faveolata* colonies in South Florida

Front Mar Sci (2024). doi:[10.3389/fmars.2024.1287457](https://doi.org/10.3389/fmars.2024.1287457)

Klein, AM, Sturm AB, Eckert RJ, Walker BK, Neely KL, Voss JD

2023



20. Does depth divide? Variable genetic connectivity patterns among shallow and mesophotic *Montastraea cavernosa* coral populations across the Gulf of Mexico and western Caribbean

Ecol Evol (2023). doi:[10.1002/ece3.10622](https://doi.org/10.1002/ece3.10622)

Sturm AB, Eckert RJ, Carreiro AM, Klein, AM, Studivan MS, Dodge Farelli D, Simões N; González-Díaz P, González Méndez J, Voss JD

2023



19. *Porites astreoides* coral populations demonstrate high clonality and connectivity in southeast Florida

Coral Reefs (2023). doi:[10.1007/s00338-023-02417-0](https://doi.org/10.1007/s00338-023-02417-0)

Shilling EN, Eckert RJ, Sturm AB, Voss JD

Citations: 653

h-index: 15

i10-index: 21

- 2023 • **18. Stony coral tissue loss disease intervention with amoxicillin leads to a reversal of disease-modulated gene expression pathways**
Mol Ecol (2023). doi:10.1111/mec.17110
Studivan MS, Eckert RJ, Shilling EN, Soderberg N, Enochs IC, Voss JD
- 2023 • **17. Diet and Feeding Ecology of the Whitespotted Eagle Ray (*Aetobatus narinari*) from Florida Coastal Waters Revealed via DNA Barcoding**
Fishes (2023). doi:10.3390/fishes8080388
Cahill BV, Eckert RJ, Bassos-Hull K, Ostendorf TJ, Voss JD, DeGroot BC, Ajemian MJ
- 2023 • **16. Coral disease outbreak at the remote Flower Garden Banks, Gulf of Mexico**
Front Mar Sci (2023). doi:10.3389/fmars.2023.1111749
Johnston MA, Studivan MS, Enochs IC, Correa AMS, Besemer N, Eckert RJ, Edwards K, Hannum R, Hu X, Nuttall MF, O'Connel K, Palacio-Castro AM, Schmahl GP, Sturm AB, Ushijima B, Voss JD
- 2022 • **15. Depth-dependent genetic structuring of a depth-generalist coral and its Symbiodiniaceae algal communities at Campeche Bank, Mexico**
Front Mar Sci (2022). doi:10.3389/fmars.2022.835789
Sturm AB, Eckert RJ, Carreiro AM, Simões N, Voss JD
- 2022 • **14. Population genetic structure of a broadcast spawning coral, *Montastraea cavernosa*, demonstrates refugia potential of upper mesophotic populations in the Florida Keys**
Coral Reefs (2022). doi:10.1007/s00338-021-02112-y
Sturm AB, Eckert RJ, Carreiro AM, Voss JD
- 2021 • **13. Quantifying impacts of stony coral tissue loss disease on corals in Southeast Florida through surveys and 3D photogrammetry**
PLoS ONE (2021). doi:10.1371/journal.pone.0252593
Combs IR, Studivan MS, Eckert RJ, Voss JD
- 2020 • **12. Population genetic structure of the great star coral, *Montastraea cavernosa*, across the Cuban archipelago with comparisons between microsatellite and SNP markers**
Sci Rep (2020). doi:10.1038/s41598-020-72112-5
Sturm AB, Eckert RJ, González Méndez J, González-Díaz P, Voss JD
- 2020 • **11. Depth influences Symbiodiniaceae associations among *Montastraea cavernosa* corals on the Belize Barrier Reef**
Front Microbiol (2020). doi:10.3389/fmicb.2020.00518
Eckert RJ, Reaume AM, Sturm AB, Studivan MS, Voss JD
- 2020 • **10. Population structure of the scleractinian coral, *Montastraea cavernosa*, in Southeast Florida**
Bull Mar Sci (2020). doi:10.5343/bms.2019.0074
Dodge DL, Studivan MS, Eckert RJ, Chei E, Beal J, Voss JD

- 2019 • **9. Populations of the coral species *Montastraea cavernosa* on the Belize Barrier Reef lack vertical connectivity**
Sci Rep (2019). doi:10.1038/s41598-019-43479-x
Eckert RJ, Studivan MS, Voss JD
- 2019 • **8. The Mesoamerican Reef**
In: Loya Y, Puglise KA, Bridge TCL (eds) Mesophotic Coral Ecosystems of the World. Springer International Publishing, Cham, pp 71–84 (2019). doi:10.1007/978-3-319-92735-0_5
Gress E, Voss JD, Eckert RJ, Rowlands G, Andradi-Brown DA
- 2019 • **7. Coral bleaching and recovery from 2016 to 2017 at East and West Flower Garden Banks, Gulf of Mexico**
Coral Reefs (2019). doi:10.1007/s00338-019-01788-7
Johnston MA, Hickerson EL, Nuttall MF, Blakeway RD, Sterne TK, Eckert RJ, Schmahl GP
- 2019 • **6. Localized coral reef mortality event at East Flower Garden Bank, Gulf of Mexico**
Bull Mar Sci (2019). doi:10.5343/bms.2018.0057
Johnston MA, Nuttall MF, Eckert RJ, Blakeway RD, Sterne TK, Hickerson EL, Schmahl GP, Lee MT, MacMillan J, Embesi JA
- 2018 • **5. Seasonal variability of carbonate chemistry and decadal changes in waters of a marine sanctuary in the Northwestern Gulf of Mexico**
Mar Chem (2018). doi:10.1016/j.marchem.2018.07.006
Hu X, Nuttall MF, Wang H, Yao H, Staryk CJ, McCutcheon MR, Eckert RJ, Embesi JA, Johnston MA, Hickerson EL, Schmahl GP, Manzello D, Enochs IC, DiMarco S, Barbero L
- 2016 • **4. Persistence of coral assemblages at East and West Flower Garden Banks, Gulf of Mexico**
Coral Reefs (2016). doi:10.1007/s00338-016-1452-x
Johnston MA, Embesi JA, Eckert RJ, Nuttall MF, Hickerson EL, Schmahl GP
- 2016 • **3. Rapid invasion of Indo-Pacific lionfishes *Pterois volitans* (Linnaeus, 1758) and *P. miles* (Bennett, 1828) in Flower Garden Banks National Marine Sanctuary, Gulf of Mexico, documented in multiple data sets**
BioInvasions Rec (2016). doi:10.3391/bir.2016.5.2.09
Johnston MA, Nuttall MF, Eckert RJ, Embesi JA, Sterne TK, Hickerson EL, Schmahl GP
- 2014 • **2. Lionfish (*Pterois volitans* [Linnaeus, 1758] and *P. miles* [Bennett, 1828]) records within mesophotic depth ranges on natural banks in the Northwestern Gulf of Mexico**
BioInvasions Rec (2014). doi:10.3391/bir.2014.3.2.09
Nuttall MF, Johnston MA, Eckert RJ, Embesi JA, Hickerson EL, Schmahl GP
- 2012 • **1. Flower Garden Banks – A refuge in the Gulf of Mexico?**
In: Yellowlees D, Hughes TP (eds) Proceedings of the 12th International Coral Reef Symposium (2012).
Hickerson EL, Schmahl GP, Johnston MA, Nuttall MF, Embesi JA, Eckert RJ



MANUSCRIPTS IN PREPARATION

- **Population genetics of the giant barrel sponge, *Xestospongia muta*, reveal distinct, hybridizing lineages across the Florida Reef Tract**
(in review)
Eckert RJ, Sturm AB, Carreiro AM, Voss JD
- **Genetic insights of key habitat-forming coral and sponge populations in Flower Garden Banks National Marine Sanctuary**
(in prep)
Eckert RJ, Sturm AB, Pantoni GS, Herrera S, Voss JD
- **Coral genetic lineages do not predict disease resistance or survivorship: a multi-species restoration experiment to assess stony coral tissue loss disease susceptibility**
(in revision)
Bell SL, Shilling EN, Pantoni GS, Eckert RJ, Sturm AB, Sharp WC, Muller EM, Gilliam DS, Lirman D, Bourque AS, Voss JD



TECHNICAL REPORTS

- 2018 ● **Stetson Bank Long-term monitoring: 2016 annual report**
Marine Sanctuaries Conservation Series ONMS-19-02. U.S. Department of Commerce, NOAA, FGBNMS, Galveston, TX. (2018).
Nuttall MF, Sterne TK, Eckert RJ, Hu X, Sinclair J, Hickerson EL, Embesi JA, Johnston MA, Schmahl GP
- 2017 ● **Long-term monitoring at East and West Flower Garden Banks: 2016 annual report**
Marine Sanctuaries Conservation Series ONMS-17-09. U.S. Department of Commerce, NOAA, FGBNMS, Galveston, TX. (2017).
Johnston MA, Sterne TK, Eckert RJ, Nuttall MF, Embesi JA, Walker RD, Hu X, Hickerson EL, Schmahl GP
- 2017 ● **Long-term monitoring at Stetson Bank, Flower Garden Banks National Marine Sanctuary, 2015 annual report**
Marine Sanctuaries Conservation Series ONMS-17-06. U.S. Department of Commerce, NOAA, FGBNMS, Galveston, TX. (2017).
Johnston MA, Sterne TK, Eckert RJ, Nuttall MF, Embesi JA, Walker RD, Hu X, Hickerson EL, Schmahl GP
- 2017 ● **Long-term monitoring at the East and West Flower Garden Banks National Marine Sanctuary, 2013–2015, volume 1: technical report**
U.S. Dept. of Interior, Bureau of Ocean Energy Management, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study BOEM 2017-058. (2017).
Johnston MA, Eckert RJ, Nuttall MF, Sterne TK, Embesi JA, Manzello DP, Hickerson EL, Schmahl GP

- 2016 ● **Long-term monitoring at East and West Flower Garden Banks: 2015 annual report**
U.S. Marine Sanctuaries Conservation Series ONMS-16-02. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Flower Garden Banks National Marine Sanctuary, Galveston, TX. (2016).
 Johnston MA, Eckert RJ, Sterne TK, Nuttall MF, Hu X, Embesi JA, Hickerson EL, Schmahl GP
- 2015 ● **Long-term monitoring at East and West Flower Garden Banks National Marine Sanctuary: 2014 annual report**
U.S. Department of Commerce, NOAA, FGBNMS, Galveston, TX. (2015).
 Johnston MA, Sterne TK, Eckert RJ, Nuttall MF, Embesi JA, Walker RD, Hu X, Hickerson EL, Schmahl GP
- 2015 ● **Long-term monitoring at East and West Flower Garden Banks National Marine Sanctuary, 2011–2012, volume 1: technical report**
U.S. Dept. of Interior, Bureau of Ocean Energy Management, Gulf of Mexico OCS Region, New Orleans, Louisiana. OCS Study BOEM 2015-027. (2015).
 Johnston MA, Nuttall MF, Eckert RJ, Embesi JA, Slowey NC, Hickerson EL, Schmahl GP
- 2014 ● **Long-term monitoring at East and West Flower Garden Banks National Marine Sanctuary: 2013 annual report**
U.S. Department of Commerce, NOAA, FGBNMS, Galveston, TX. (2014).
 Johnston MA, Nuttall MF, Eckert RJ, Embesi JA.
- 2013 ● **Long-term monitoring at the East and West Flower Garden Banks National Marine Sanctuary, 2009–2010, volume 1: technical report**
U.S. Dept. of Interior, Bureau of Ocean Energy Management, Gulf of Mexico OCS Region, New Orleans, Louisiana. OCS Study BOEM 2013-214. (2013).
 Johnston MA, Nuttall MF, Eckert RJ, Embesi JA, Slowey NC, Hickerson EL, Schmahl GP



PRESENTATIONS

- 2024 ● **Cryptic diversity of *Stephanocoenia intersepta* corals throughout Southeast Florida and the Florida Keys**
 2024 AAUS Diving for Science Symposium 📍 Fort Pierce, FL
 Eckert RJ, Sturm AB, Carreiro AM, Pantoni GS, Klein AM, Voss JD
 Poster presentation
- 2024 ● **Cryptic diversity of *Stephanocoenia intersepta* corals throughout Southeast Florida and the Florida Keys**
 52nd Annual Benthic Ecology Meeting 📍 Charleston, SC
 Eckert RJ, Sturm AB, Carreiro AM, Pantoni GS, Klein AM, Voss JD
 Poster presentation
- 2023 ● **Genetically divergent mesophotic and shallow *Stephanocoenia intersepta* populations in the Florida Keys**
 51st Annual Benthic Ecology Meeting 📍 Miami, FL
 Eckert RJ, Sturm AB, Carreiro AM, Klein AM, Voss JD
 Poster presentation

- 2023 ● **Genetically divergent mesophotic and shallow *Stephanocoenia intersepta* populations in the Florida Keys**
 Mesophotic Coral Ecosystem Gordon Research Conference 📍 Ventura, CA
 Eckert RJ, Sturm AB, Carreiro AM, Klein AM, Voss JD
 Poster presentation
Best overall student presentation
- 2023 ● ***Stephanocoenia intersepta* corals in Florida Keys National Marine Sanctuary exhibit depth-dependent genetic structure**
 Mesophotic Coral Ecosystem Gordon Research Symposium 📍 Ventura, CA
 Eckert RJ, Sturm AB, Carreiro AM, Klein AM, Voss JD
 Oral presentation
- 2022 ● **Genetic connectivity and algal symbiont communities of shallow and mesophotic *Stephanocoenia intersepta* populations in the Florida Keys**
 15th International Coral Reef Symposium 📍 Bremen, Germany.
 Eckert RJ, Sturm AB, Carreiro AM, Klein AM, Voss JD
 Oral presentation
- 2022 ● **Genetic connectivity and genetic diversity of shallow and mesophotic *Stephanocoenia intersepta* populations throughout Florida Keys National Marine Sanctuary.**
 50th Annual Benthic Ecology Meeting 📍 Portsmouth, NH.
 Eckert RJ, Sturm AB, Carreiro AM, Klein AM, Voss JD
 Oral presentation
- 2019 ● **Genetically distinct depth-stratified *Montastraea cavernosa* coral populations on the Belize Barrier Reef harbor relatively homogenous Symbiodiniaceae communities**
 48th Annual Benthic Ecology Meeting 📍 St. John's, NL, Canada.
 Eckert RJ, Reaume A, Voss JD
 Oral presentation
- 2019 ● **Populations of the coral species *Montastraea cavernosa* lack vertical connectivity on the Belize Barrier Reef**
 ASLO Aquatic Sciences Meeting 📍 San Juan, PR.
 Eckert RJ, Studivan MS, Voss JD
 Poster presentation
- 2018 ● **Affordable and ecologically relevant graduate research on the world's second largest barrier reef? You better Belize it!**
 HBOI Science Seminar 📍 Ft. Pierce, FL.
 Eckert RJ and Studivan MS
 Oral presentation
- 2018 ● **Connected corals: population genetics of *Montastraea cavernosa* on the Belize Barrier Reef**
 HBOI Ocean Discovery Center Marine Science Friday 📍 Ft. Pierce, FL.
 Eckert RJ
 Oral presentation

- 2018 ● **Breaking point: population genetics reveal a lack of vertical connectivity of *Montastraea cavernosa* on the Belize Barrier Reef**
47th Annual Benthic Ecology Meeting 📍 Corpus Christi, TX.
Eckert RJ, Studivan MS, Voss JD
Oral presentation
- 2013 ● **Ciguatera fish poisoning in the northwestern Gulf of Mexico.**
66th Gulf and Caribbean Fisheries Institute Conference 📍 Corpus Christi, TX
Eckert RJ, Loeffler C, Robertson A, Johnston MA, Hickerson EL, Schmahl GP
Poster presentation
- 2009 ● **Associational resistance and susceptibility in *Solanum carolinense***
Southeastern Ecology and Evolution Conference 📍 Gainesville, FL.
Eckert RJ, Kim T, Underwood N
Poster presentation



FUNDING

- 2023 ● **Smithsonian NMNH Research Fellowship**
\$16,000
- 2023 | 2017 ● **FAU GPSA Travel Awards**
\$3,023
- 2021 ● **PADI Foundation Grant**
\$4,377
- 2021 | 2019 ● **FAU Presidential Fellowship**
\$10,000
- 2018 ● **FAU Thesis Award**
\$500
- 2018 ● **PADI Foundation Grant**
\$4,973
- 2009 ● **Bess H. Ward Honors Thesis Award**
\$1,000
- 2009 | 2005 ● **Florida Bright Futures Academic Scholarship**
\$14,850
- 2009 | 2005 ● **Florida State University Freshman Academic Scholarship**
\$8,000
- 2005 ● **Florida State University Freshman AP Scholarship**
\$500



AWARDS

- 2025 ● **Graduate Researcher of the Year**
Florida Atlantic University Northern Campus Awards
- 2025 ● **Florida Atlantic University Student Publishing Award**
Awarded for 3 publications in 2024

2021
|
2019

2020

2009
|
2006

2005

- **Florida Atlantic University Presidential Fellow**
- **Florida Atlantic University Student Publishing Award**
Awarded for 3 publications in 2019
- **Florida State University Dean's List**
- **Florida State University President's List**



CERTIFICATIONS

- **AAUS Scientific Diver**
100 m, CCR, Trimix
- **TDI Technical SCUBA Diver**
Advanced Nitrox, Decompression Procedures, Trimix 100 m, Closed-Circuit Rebreather, Advanced Mixed Gas CCR
- **PADI Trimix Gas Blender**
- **DAN Oxygen delivery, First Aid, and CPR for scuba diving injuries**
- **USCG Licensed Merchant Mariner**
100 GRT
- **USFWS Motorboat Operator Certification Course**
- **Sea-Bird Electronics technician**
- **NOAA Working SCUBA Diver**



SKILLS

- **DNA and RNA extraction, PCR, qPCR, Gel electrophoresis, NGS library preparation, Agilent Bioanalyzer (DNA, RNA)**
- **Bioinformatic analyses, multivariate statistics, and data visualization**
R statistical software, Python, Bash, PRIMER7, and CPCe
- **Coral sampling, benthic surveys, fish surveys, photography, navigation and mapping**
- **Offshore field research cruise planning, logistics, and execution**
- **Technical SCUBA diving, closed-circuit rebreather diving, operation of Nitrox compressor systems, and Trimix blending**

- **Setup, operation, and maintenance of oceanographic equipment**
Sea-Bird Electronics, Onset HOBO, YSI
- **Adobe InDesign, Adobe Illustrator, and Adobe Photoshop**
- **Operation, navigation, and handling of small boats**
Marlinspike, and mooring buoy construction/installation/maintenance



MEMBERSHIP AND SERVICE

Present



2020

Present



2019

Present



2017

- **Mesophotic.org**
Content Editor
- **International Coral Reef Society**
- **Benthic Ecology Meeting Society**
- **Reviewer for:**
Scientific Reports, Environmental Monitoring and Assessment, Marine Ecology Progress Series
- **HBOI Graduate Student Association**
Vice President 📍 Ft. Pierce, FL
- **HBOI Graduate Student Association**
Secretary 📍 Ft. Pierce, FL
- **Association for the Studies of Limnology and Oceanography**

2022

2021,

2019

2019

2018



REFERENCES

- **Dr. Joshua Voss**
Ph.D. Advisor
Florida Atlantic University
jvoss2@fau.edu
- **Dr. Adrienne Correa**
Assistant Professor
UC Berkeley
amsc@berkeley.edu
- **G.P. Schmahl**
Superintendent
Flower Garden Banks National Marine Sanctuary
george.schmahl@noaa.gov

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