

RYAN J. ECKERT

Coral reef ecology, mesophotic coral ecosystems, molecular ecology



EDUCATION

- Present | 2019 • **Ph.D. Candidate in Integrative Biology**
Florida Atlantic University 📍 Boca Raton, FL
Dissertation: Population genetics, community ecology, and larval dispersal in shallow and mesophotic coral ecosystems in the Tropical Western Atlantic
Advisor: Dr. Joshua Voss
- 2019 | 2017 • **M.Sc. in Biological Sciences**
Florida Atlantic University 📍 Boca Raton, FL
Thesis: Population genetics and algal symbiont communities of the coral species *Montastraea cavernosa* on the Belize Barrier Reef
Advisor: Dr. Joshua Voss
- 2009 | 2005 • **B.Sc. in Biological Sciences**
Florida State University 📍 Tallahassee, FL
Thesis: Associational resistance and susceptibility in *Solanum carolinense*
Advisor: Dr. Nora Underwood

RESEARCH EXPERIENCE

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

TEACHING EXPERIENCE

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

CONTACT

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📺 [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



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. Assesment 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: 580

h-index: 14

i10-index: 19

- 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

- **Coral genetic lineages do not predict disease resistance or survivorship: a multi-species restoration experiment to assess stony coral tissue loss disease susceptibility**

Bell SL, Shilling EN, Pantoni GS, **Eckert RJ**, Sturm AB, Sharp WC, Muller EM, Gilliam DS, Lirman D, S. Bourque AS, Voss JD

- **Population genetics of the Giant Barrel Sponge, *Xestospongia muta* across the Florida Reef Tract**

Eckert RJ, Sturm AB, Carreiro AM, 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

- 2021 | 2019 • **Florida Atlantic University Presidential Fellow**
- 2020 • **Florida Atlantic University Student Publishing Award**
Awarded for 3 publications in 2019
- 2009 | 2006 • **Florida State University Dean's List**
- 2005 • **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 • **Mesophotic.org**
Content Editor
- Present | 2019 • **International Coral Reef Society**
- Present | 2017 • **Benthic Ecology Meeting Society**
- **Reviewer for:**
Scientific Reports, Environmental Monitoring and Assessment, Marine Ecology Progress Series
- 2022 • **HBOI Graduate Student Association**
Vice President 📍 Ft. Pierce, FL
- 2021, 2019 • **HBOI Graduate Student Association**
Secretary 📍 Ft. Pierce, FL
- 2019 | 2018 • **Association for the Studies of Limnology and Oceanography**



REFERENCES

- **Dr. Joshua Voss**
Ph.D. Advisor 📍 Florida Atlantic University
+1 (772) 242-2538 jvoss2@fau.edu
- **Dr. Adrienne Simoes-Correa**
Assistant Professor 📍 Rice University
+1 (713) 348-3054 ac53@rice.edu
- **G.P. Schmahl**
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