

# 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

📍 5600 US1 N, Ft. Pierce, FL 34946  
📞 +1 (772) 224-2396  
✉ [ryan.j.eckert@gmail.com](mailto:ryan.j.eckert@gmail.com)  
💻 [ryanjeckert.weebly.com](http://ryanjeckert.weebly.com)  
🐦 [CnidaRyan](#)  
🌐 [RyanEckert](#)  
📺 [Ryan J Eckert](#)

## SKILLS

Coral reef ecology  
Technical SCUBA diving  
Closed-circuit rebreather diving  
900+ Scientific Dives  
450+ 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  
21<sup>st</sup> Century ACE

📍 Galveston, TX



## STUDENTS MENTORED

**Emily Chei**

**Link fellowship intern**

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

📍 2018

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

**Ashley Reaume**

**Link fellowship intern**

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

📍 2017

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



## REFEREED PUBLICATIONS

2023

**16. Coral disease outbreak at the remote Flower Garden Banks, Gulf of Mexico**

*Front Mar Sci* (2023). [doi:10.3389/fmars.2023.1111749](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1038/s41598-020-72112-5)

Sturm AB, **Eckert RJ**, González Méndez J, González-Díaz P, Voss JD

Citations: 344

h-index: 12

i10-index: 13

- 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, Saryk 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**  
*BiolInvasions 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

- Eckert RJ, Sturm AB, Carreiro AM, Klein AM, Voss JD • ***Stephanocoenia intersepta* corals in Florida Keys National Marine Sanctuary exhibit depth-dependent genetic structure**  
 (in prep).  
 N/A
- **Single nucleotide polymorphism (SNP) data show high clonality and horizontal connectivity of *Porites astreoides* populations in southeast Florida**  
*Coral Reefs* (in revision).  
 Shilling EN, **Eckert RJ**, Sturm AB, Voss JD
- **Does depth divide? Variable genetic connectivity patterns among shallow and mesophotic *Montastraea cavernosa* coral populations across the Gulf of Mexico and western Caribbean**  
*Mol Ecol* (submitted).  
 Sturm AB, **Eckert RJ**, Carreiro AM, Klein AM, Studivan MS, Dodge Farelli D, Simões N; González-Díaz P, González Méndez J, Voss JD
- Studivan MS, Eckert RJ, Shilling EN, Soderberg N, Enochs IC, Voss JD • **Evaluating stony coral tissue loss disease intervention success through whole-transcriptome gene expression profiling**  
 (in prep).  
 N/A



## 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

- 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

- **PADI Foundation Grant**  
\$4,377  2021
- **FAU Presidential Fellowship**  
\$10,000  2021 - 2019
- **FAU GPSA Travel Awards**  
\$1,600  2019 - 2018
- **FAU Thesis Award**  
\$500  2018
- **PADI Foundation Grant**  
\$4,973  2018
- **Bess H. Ward Honors Thesis Award**  
\$1,000  2009
- **Florida Bright Futures Academic Scholarship**  
\$14,850  2009 - 2005
- **Florida State University Freshman Academic Scholarship**  
\$8,000  2009 - 2005
- **Florida State University Freshman AP Scholarship**  
\$500  2005

## AWARDS

- **Florida Atlantic University Presidential Fellow**  
2021 - 2019

### **Florida Atlantic University Student Publishing Award**

Awarded for 3 publications in 2019

2020

### **Florida State University Dean's List**

2009 - 2006

### **Florida State University President's List**

2005

## CERTIFICATIONS

### **AAUS Scientific Diver**

200', CCR, Trimix

### **TDI Technical SCUBA Diver**

Advanced Nitrox, Decompression Procedures, Trimix 200', Closed-Circuit Rebreather, 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**

### **Mesophotic.org**

Content Editor

Present - 2020

### **International Coral Reef Society**

Present - 2019

### **Benthic Ecology Meeting Society**

Present - 2017

### **HBOI Graduate Student Association**

Vice President

Ft. Pierce, FL

2022

### **HBOI Graduate Student Association**

Secretary

Ft. Pierce, FL

2021, 2019



**Association for the Studies of Limnology and Oceanography**

2019 - 2018

**Reviewer for:**

Scientific Reports



## REFERENCES

### **Dr. Joshua Voss**

Ph.D. Advisor

Florida Atlantic University

N/A

+1 (772) 242-2538

[jvoss2@fau.edu](mailto:jvoss2@fau.edu)

### **Dr. Adrienne Simoes-Correa**

Assistant Professor

Rice University

N/A

+1 (713) 348-3054

[ac53@rice.edu](mailto:ac53@rice.edu)

### **G.P. Schmahl**

Superintendent

Flower Garden Banks National Marine Sanctuary

N/A

+1 (409) 621-5151

[george.schmahl@noaa.gov](mailto:george.schmahl@noaa.gov)