

# MELISSA M ROCKER, PhD

[linkedin.com/in/melissa-rocker](https://www.linkedin.com/in/melissa-rocker)

## RESEARCH INTERESTS

My research interests include the ideal management of our Earth's marine resources, the conservation and protection of these species and their environment, as well as the long-term effects of anthropogenically-induced deterioration of the marine environment. Discovery and implementation of innovative practices for optimal utilization and protection of these resources is paramount to me.

## PROFESSIONAL EXPERIENCE

### **Bigelow Laboratory for Ocean Sciences**

October 2023 – Present

#### ***Postdoctoral Research Scientist***

Conduct research in the broader area of Marine Disease Ecology and Fisheries Health, as well as publish and disseminate research arising from research activities, including the Sea Grant American Lobster Initiative. Collaborate with fishers (industry), resource managers, and scientists on research investigating epizootic shell disease in American lobster. Provide supervisory support and mentoring to laboratory members and student candidates.

*Supervisor: Dr. Maya Groner*

### **Deakin University**

August 2018 – October 2023

#### ***Honorary Associate Research Fellow, Nutritional and Seafood Laboratory***

Initiate and conduct research in the broader area of Aquaculture Nutrition, as well as publish and disseminate research emanating from a range of research activities, including the Deakin Ridley Aquaculture Research Initiative. Collaborate on research projects investigating terrestrially-derived aquafeed ingredients, farmed abalone health and nutrition, and farmed fish flavor enhancement. Provide supervisory support to PhD and honors student candidates.

*Supervisor: Ass. Prof. David Francis*

#### ***Technical Officer, School of Life and Environmental Science – Forensic Sciences***

Provided technical support and management of undergraduate forensic laboratories, as well as technical expertise in the use and maintenance of scientific equipment and instruments. Facilitated and managed the delivery of forensic outreach programs to secondary school students and the public.

*Supervisor: Mr. David Gleadon*

### **Australian Institute of Marine Science**

March 2018 – August 2018

#### ***Research Officer***

Created the research and development plan and the interventions portfolio for the Reef Restoration and Adaptation Program to progress reef restoration efforts on the Great Barrier Reef. *\*Short-term, 6-month contract*

*Supervisor: Dr. Line Bay*

### **Deakin University**

February 2017 – December 2017

#### ***Technical Officer, School of Life and Environmental Science – Molecular Biology***

Provided technical support and management of undergraduate biological and molecular laboratories, as well as technical expertise in the use and maintenance of scientific equipment and instruments. Managed the School's store (chemicals and equipment), including organization of stocks, orders and expenditures, liaising with customers, and negotiating pricing with suppliers.

*Supervisor: Mr. David Gleadon*

### **James Cook University and Australian Institute of Marine Science**

April 2012 – December 2016

#### ***Doctorate of Philosophy in Marine Biology***

Designed, executed, and analyzed field and laboratory studies to examine the capacity of coral reefs to acclimatize and adapt to local stressors on the inshore Great Barrier Reef using observational, experimental and manipulative frameworks.

Supervisors: Dr. Line Bay, Prof. Bette Willis and Dr. Katharina Fabricius

### **Coral Technician**

Completed field collection and laboratory analyses of field samples to examine the capacity of corals to acclimatize and survive the 2016 Bleaching Event of the Great Barrier Reef using genomic, biochemical and statistical analyses.

Supervisors: Dr. Line Bay and Dr. Neal Cantin

### **Graduate Teaching Assistant**

Delivered practical content, supervised practical courses, and graded student assignments regarding the biology and life history of reef corals.

Supervisors: Prof. Bette Willis and Dr. David Bourne

## **EDUCATION**

### **Doctorate of Philosophy in Marine Biology**

December 2016

*James Cook University and Australian Institute of Marine Science, Townsville, QLD, AUSTRALIA*

Thesis title: Effects of local stressors on the health and condition of inshore corals

### **Graduate Diploma of Research Methods**

January 2012

*James Cook University, Townsville, QLD, AUSTRALIA*

GPA: 6.875/7.0

Thesis title: Thermal stress-related gene expression in corals with different *Symbiodinium* types

### **Bachelor of Science in Marine Biology**

May 2007

*Honors College, College of Charleston, Charleston, SC, UNITED STATES*

GPA: 3.63/4.0 – *Cum laude*

## **PUBLICATIONS**

### **Peer-Reviewed Journal Articles**

- 17) Hassan ALI, Mock TS, Searle K, **Rocker MM**, Turchini GM, Francis DS (2023) Growth performance and feed utilisation of Australian hybrid abalone (*Haliotis rubra* x *Haliotis laevis*) fed increasing dietary protein levels at three water temperatures. *British Journal of Nutrition* DOI 10.1017/S0007114523002519
- 16) Hassan ALI, Mock TS, Searle K, **Rocker MM**, Turchini GM, Francis DS (2023) Optimal dietary protein requirement of sub-adult Australian hybrid abalone (*Haliotis rubra* x *Haliotis laevis*) at different rearing temperatures. *Aquaculture Research* DOI 10.1155/2023/1676340
- 15) Colombo SM, Roy K, Mraz J, Wan AHL, Davies S, Tibbetts SM, Øverland M, Francis DS, **Rocker MM**, Gasco L, Spencer E, Metian M, Trushenski JT, Turchini GM (2022) Toward achieving circularity and sustainability in feeds for farmed blue foods. *Reviews in Aquaculture* DOI 10.1111/raq.12766
- 14) **Rocker MM**, Mock TS, Turchini GM, Francis DS (2022) The judicious use of finite marine resources can sustain Atlantic salmon (*Salmo salar*) aquaculture to 2100 and beyond. *Nature Food* DOI 10.1038/s43016-022-00561-4
- 13) Francis DS, **Rocker MM** (2022) Growth of the Atlantic salmon aquaculture industry does not require more fish oil. *Nature Food* DOI 10.1038/s43016-022-00562-3
- 12) Mock TS, Alkhabbaz ZH, **Rocker MM**, Lewis MJ, Cumming. EE, Smullen RP, Turchini GM, Francis DS (2022) Gut transit rate in Atlantic salmon (*Salmo salar*) exposed to optimal and sub-optimally high water temperatures. *Aquaculture Research* DOI 10.1111/are.15979
- 11) Jones BC, **Rocker MM**, Keast RSJ, Callahan DL, Redmond HJ, Smullen RP, Francis DS (2022) Contributions of volatile compounds to the flavour profile of aquaculture products – Targeting key volatile compounds to optimise flavour quality. *Reviews in Aquaculture* DOI 10.1111/raq.12657

- 10) Botte ES, Cantin NE, Mocellin VJL, O'Brien P, **Rocker MM**, Frade PR, Webster N (2021) Reef location has a greater impact than coral bleaching severity on the microbiome of *Pocillopora acuta*. *Coral Reefs* DOI 10.1007/s00338-021-02201-y
- 9) **Rocker MM**, Lewis MJ, Mock TS, Francis DS, Bellagamba F, Moretti VM, Quinn GP, Smullen RP, Turchini GM (2021) Poultry offal meal production conditions impact meal quality and digestibility in Atlantic salmon (*Salmo salar*). *Aquaculture* DOI 10.1016/j.aquaculture.2021.736909
- 8) Strahl J, **Rocker MM**, Fabricius KE (2019) Contrasting responses of the coral *Acropora tenuis* to moderate and strong light limitation in coastal waters. *Marine Environmental Research* DOI 10.1016/j.marenvres.2019.04.003
- 7) **Rocker MM**, Francis DS, Fabricius KE, Willis BL, Bay KL (2019) Temporal and spatial variation in fatty acid composition in *Acropora tenuis* corals along water quality gradients on the Great Barrier Reef, Australia. *Coral Reefs* DOI 10.1007/s00338-019-01768-x
- 6) **Rocker MM**, Kenkel CD, Francis DS, Willis BL, Bay KL (2019) Plasticity in gene expression and fatty acid profiles of *Acropora tenuis* reciprocally transplanted between two water quality regimes in the central Great Barrier Reef, Australia. *Journal of Experimental Marine Biology and Ecology* 511: 40-53. DOI 10.1016/j.jembe.2018.11.004
- 5) Conlan J, **Rocker MM**, Francis DS (2017) A comparison of two common sample preparation techniques for lipid and fatty acid analysis in three different coral morphotypes reveals quantitative and qualitative. *PeerJ* 5:e3645. DOI 10.7717/peerj.3645
- 4) **Rocker MM**, Francis DS, Fabricius KE, Willis BL, Bay KL (2017) Variation in the health and condition of the coral *Acropora tenuis* along two water quality gradients on the Great Barrier Reef. *Marine Pollution Bulletin* 119: 106-119. DOI 10.1016/j.marpolbul.2017.03.066
- 3) **Rocker MM**, Noonan S, Humphrey C, Moya A, Willis BL, Bay LK (2015) Expression of calcification and metabolism-related genes in response to elevated pCO<sub>2</sub> and temperature in the reef-building coral *Acropora millepora*. *Marine Genomics* 24: 313-318. DOI 10.1016/j.margen.2015.08.001
- 2) **Rocker MM**, Brandl SJ (2014) Transplantation of corals into a new environment results in substantial skeletal loss in *Acropora tenuis*. *Marine Biodiversity* 45: 321-326. DOI 10.1007/s12526-014-0239-y
- 1) **Rocker MM**, Willis BL, Bay LK (2012) Thermal stress-related gene expression in corals with different *Symbiodinium* types. *Proceedings of the 12<sup>th</sup> International Coral Reef Symposium*, Cairns, Australia

### Government Reports

- 2) Francis DS, **Rocker MM**, Searle K, Hassan ALI, Cumming EE, Clark TD, Donald JA, Turchini GM, Mock TS (2021) Elucidating the nutritional requirements of farmed hybrid abalone. Deakin University, Queenscliff, VIC. FRDC Project No. 2017/113
- 1) Bay LK, **Rocker MM**, Bonstrom-Einarsson L, Babcock R, Buerger P, Cleves P, Harrison D, Negri A, Quigley K, Randall CJ, van Oppen MJH, Webster N (2019) Reef Restoration and Adaptation Program: Intervention Technical Summary. Reef Restoration and Adaptation Program, Australian Institute of Marine Science, Townsville, QLD

### SKILLS & EXPERTISE

- Project and time management
- Colleague and team management and student supervision
- Conceptualize, research and disseminate comprehensive scientific projects
- Write, edit and publish peer-reviewed journal manuscripts and government reports
- Apply for, organize and secure external funding and grants
- Communicate with and present to a variety of audiences

- General public
- Industry partners and stakeholders
- Academics and scientific community

### Analytical Techniques & Computer Skills

- Statistical/programming language R
  - Linear and non-linear modeling
  - Multivariate statistical tests
  - Parametric and non-parametric techniques
- Microsoft Office applications
- Online communication tools (e.g. Zoom)
- Adobe Creative Suite, Image J and QuickBooks applications

### Experimental and Fieldwork Techniques

- *In situ* experiments
- Transplantation experiments
- Controlled laboratory experiments
- Biological response variables
  - Survivorship and growth
  - Photosynthetic efficiency
  - Metabolic rates
- Long-term monitoring
- Biota and specimen collection
- Maintenance of aquaria and husbandry
- Water quality variables
  - Temperature
  - Dissolved oxygen
  - Suspended sediments

### Laboratory Techniques

- Genetic analyses
  - DNA typing
  - PCR and qPCR
  - RNA sequencing
- Biochemical analyses
  - Fatty acids
  - Lipids
  - Proteins
- Physiological analyses
  - Respiration rates
  - Photosynthetic rates
  - Calcification rate

### Certifications

- PADI Certified Rescue SCUBA Diver
- First Aid and CPR Certification
- Mental Health First Aid
- USA and Australian Open Driver Licenses
- Marine VHF Certification

### GRANTS, AWARDS and HONORS

- Accelerator SEBE Industry PhD scholarship for ECR – \$120,000 (AUD) 2021
- Prokaryotes treatments and coral nutrition (RRAP) – \$300,000 (AUD) 2021
- Spicy Fish – Novel bioactive evaluation for fish performance – \$45,000 (AUD) 2020
- Vice-Chancellor’s Professional Development Award – \$2,000 (AUD) 2019
- James Cook University Doctoral Completion Scheme – \$3,000 (AUD) 2015
- GBRMPA Science for Management Award – \$2,000 (AUD) 2014
- Three Minute Thesis College of Marine and Environmental Science Conference 2<sup>nd</sup> Place 2014
- James Cook University Graduate Research School Grant – \$1,000 (AUD) 2013
- PADI Foundation Grant – \$8,000 (USD) 2013
- National Environmental Research Program Grant – \$5,200 (AUD) 2012
- James Cook University, Graduate Research Scheme – \$2,000 (AUD) 2012
- Science Communication Grant from AIMS – \$1,500 (AUD) 2012
- James Cook University International Postgraduate Fellowship – \$161,184 (AUD) 2012

### PRESENTATIONS

- Forensic Applications - FTIR (Deakin University Practicals) 2018 – 2019
- Forensic Anthropology (Deakin University STEM OutReach) 2019
- Life History of Reef Corals (Undergraduate – MB3210) 2012 – 2016

- Life History of Reef Corals (Masters – MB5400) 2012 – 2016
- International Coral Reef Symposium, Honolulu (United States) 2016
- Australian Coral Reef Society Annual Conference, Day Dream Island (Australia) 2015
- Australian Institute of Marine Science Student Seminar Day, Townsville (Australia) 2015
- College of Marine and Environmental Science Student Conference, Townsville (Australia) 2015
- Australian Institute of Marine Science Student Seminar Day, Townsville (Australia) 2014
- 12th International Coral Reef Symposium, Cairns (Australia) 2012
- Australian Institute of Marine Science Student Seminar Day, Townsville (Australia) 2012
- Biology in the Tropics Conference, Townsville (Australia) 2012

## STUDENT SUPERVISION

### Co-Supervisor, Nutrition and Seafood Laboratory

- Miss. Emily Courtot, PhD at Deakin University 2021 – present  
Thesis: Optimising Astaxanthin supplementation in Atlantic salmon in periods of thermal stress
- Miss. Paige Miles, PhD at Deakin University 2021 – present  
Thesis: Ensuring summer welfare of Atlantic salmon through modulation of gut transit
- Miss. Courtney Bourke, PhD at Deakin University 2021 – present  
Thesis: Future-proofing the salmon farming industry in the face of climate change
- Mr. Kieren Searle, PhD at Deakin University 2018 – 2023  
Thesis: Elucidating the nutritional and metabolic requirements of farmed hybrid abalone
- Miss. Hannah Redmond, PhD at Deakin University 2017 – present  
Thesis: Investigating odour-active volatile components of farmed barramundi

## REFERENCES

*Available upon request.*