

CV: Mike McWilliam

PERSONAL

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Citizenship: British (Resident visa to Australia, subclass 100).

[Website](#) | [Twitter](#) | [GitHub](#)

CURRENT POSITION

01.05.2022 to Present
Leverhulme Early Career Research Fellow
Centre for Biological Diversity, University of St Andrews, UK
Project: *Demographic shifts in the Global Sea-floor*
Funding: Leverhulme ECF-2021-512

PRIOR POSITIONS

18.08.2019 to 29.04.2022
Postdoctoral Research Fellow in Quantitative Ecology
Hawaii Institute of Marine Biology, University of Hawaii Manoa, USA
Project: *Trait-based filtering and biodiversity change on coral reefs*
Funding: NSF grant 1948946 with Prof. Joshua Madin

03.09.2018 to 12.07.2019
Research Associate in Coral Reef Biodiversity
ARC Centre of Excellence for Coral Reef Studies, James Cook University, Australia
Project: *The functional biogeography of the Pacific Ocean*
Funding: Laureate fellowship to Prof. Terry Hughes

EDUCATION

05.01.2015 to 03.09.2018
PhD (*Cum Laude*), Natural and Physical Sciences
ARC Centre of Excellence for Coral Reef Studies, James Cook University, Australia
Thesis title: [The functional diversity and redundancy of corals](#)
Supervisors: Prof. Terry Hughes, Associate Prof. Mia Hoogenboom
Funding: Australian Postgraduate Research Scholarship

09.10.2009 to 15.06.2012
BA (Hons 1st Class) Biological Sciences
University of Oxford, UK
Dissertation: *Evolutionary radiations of Antarctic Hydrocorals*

RESEARCH INTERESTS

Demography	Trade-offs in demographic rates; comparative demography and traits ^{8, 11}
Biogeography	Global patterns of biodiversity using spatial and functional trait data ^{2, 5}
Resilience	Long-term dynamics; disturbance, recovery and regime shifts ^{6, 10}
Climate Change	Response of populations and ecosystems to warming; coral bleaching ^{1, 3, 12}
Ecosystem function	Diversity-productivity relationships; facilitation and response diversity ^{4, 7}

PUBLICATIONS - [Google Scholar](#)

- 2017 ¹ Hughes, T. P., Kerry, J. T., Álvarez-Noriega, M., Álvarez-Romero, J. G., Anderson, K. D., Baird, A. H., ... & **McWilliam, M.J.** (2017). Global warming and recurrent mass bleaching of corals. *Nature*, 543(7645), 373 *Cover feature ⇒
- 2018 ² **McWilliam, M.**, Hoogenboom, M. O., Baird, A. H., Kuo, C. Y., Madin, J. S., & Hughes, T. P. (2018). Biogeographical disparity in the functional diversity and redundancy of corals. *Proceedings of the National Academy of Sciences*, 115 (12) 3084-3089 ⇒

- ³ Hughes, T. P., Kerry, J. T., Baird, A. H., Connolly, S. R., Dietzel, A., Eakin, C. M., ... & **McWilliam, M. J.** (2018). Global warming transforms coral reef assemblages. *Nature*, 556.7702 (2018): 492 *F1000 recommended ⇒
- ⁴ **McWilliam, M.**, Chase, T.J., Hoogenboom, M.O. (2018). Neighbor Diversity Regulates the Productivity of Coral Assemblages. *Current Biology* 28.22 (2018): 3634-3639 *Cover feature *F1000 recommended ⇒
- 2019 ⁵ Dospot, N. E., **McWilliam, M. J.**, Pratchett, M. S., Hoey, A. S., & Figueira, W. F. (2019). Plasticity in Three-Dimensional Geometry of Branching Corals Along a Cross-Shelf Gradient. *Diversity*, 11(3), 44. ⇒
- 2020 ⁶ **McWilliam, M.**, Pratchett, M. S., Hoogenboom, M. O., & Hughes, T. P. (2020). Deficits in functional trait diversity following recovery on coral reefs. *Proceedings of the Royal Society B*, 287(1918), 20192628. ⇒
- ⁷ Chase, T. J., Pratchett, M. S., **McWilliam, M. J.**, Hein, M. Y., Tebbett, S. B., & Hoogenboom, M. O. (2020). Damselfishes alleviate the impacts of sediments on host corals. *Royal Society Open Science*, 7(4), 192074. ⇒
- ⁸ Pratchett, M. S., **McWilliam, M. J.**, & Riegl, B. (2020). Contrasting shifts in coral assemblages with increasing disturbances. *Coral Reefs*, 1-11 ⇒
- 2021 ⁹ Roach, T. N., Yadav, S., Caruso, C., Dilworth, J., Foley, C. M., **McWilliam, M. J.**, ... & Madin, J. S. (2021). A field primer for monitoring benthic ecosystems using structure-from-motion photogrammetry. *JoVE (Journal of Visualized Experiments)*, (170), e61815. ⇒
- 2022 ¹⁰ Bridge, T. C., Baird, A. H., Pandolfi, J. M., **McWilliam, M. J.**, & Zapalski, M. K. (2022). Functional consequences of Palaeozoic reef collapse. *Scientific Reports*, 12(1), 1-10. ⇒
- ¹¹ **McWilliam, M.**, Dornelas M., Álvarez-Noriega, M., Baird, A.H., Connolly, S.R., Madin. J.S. Net effects of life history traits explain persistent differences in abundance among similar species. *Ecology* (In Press) ⇒
- ¹² **McWilliam, M.**, Madin J.M., Chase, T.C, Hoogenboom, M.H., Bridge, T. C., Intraspecific variation reshapes coral assemblages under elevated temperature and acidity. *Ecology Letters* (In Press) ⇒

PUBLICATIONS IN REVISION –

- 2022 Madin, J. S., **McWilliam, M.**, Quigley, K., Bay, L. K., Bellwood, D., Doropoulos, C., ... & Zhou, H. X. Selecting species for restoration in foundational assemblages. *In Revision*
- Yadav, S., Roach, T., **McWilliam M.**, *et al.* Fine scale variability in coral bleaching and mortality during a marine heatwave. *Submitted*

MEDIA COVERAGE

- 2020 Recovery study⁶ featured in 'When reef ecosystems fail to recover' [China Daily](#).
- 2019 Reef productivity study⁴ highlighted on [F1000 Prime](#).
- 2018 Coral bleaching study³ reaches the 2018 [Altmetric Top 100](#) (#9); over 200 news articles
Biogeography study² in a [PNAS featurette](#) 'Diversity in tropical reef ecosystems'
Biogeography study² in a [Coral COE](#) article, 'Redundancy offers reassurance to reefs'

- 2017 Coral bleaching study¹ reaches the 2017 [Altmetric Top 100](#) (#21); over 350 news articles
- 2016 '13 Messages from Marine Biologists Fighting for the Great Barrier Reef' [Buzzfeed](#)

PRESENTATIONS & WORKSHOPS

- 2022 Presenter: "*Multiple demographic dimensions predict fitness and abundance in tropical reef assemblages*", International Coral Reef Symposium (ICRS), Bremen, Germany
SCORE-REEF workshop: To define the global spectrum of reef form and function in a human-dominated world, Montpellier, France (lead: Valeriano Parravicini).
Invited Speaker: "*Trait-based filtering and biodiversity change on coral reefs*", German Centre for Integrative Biodiversity Research (iDiv), Leipzig, Germany
sTeTra workshop; To synthesize global changes in trait diversity over time, Centre for Integrative Biodiversity Research (iDiv), Leipzig, Germany (lead: Maria Dornelas)
- 2020 Species Choice Workshop, Virtual workshop applying trait ecology to the selection of species for assisted evolution and restoration (lead: Madeleine Van Oppen).
Invited speaker: "*Navigating coral trait space*" Department of Biology Seminar Series, University of Hawaii Manoa
- 2019 Coral Demography Workshop: To facilitate coral demographic analysis, Boone Center at Wrigley Marine Science Center, Santa Catalina Island (lead: Morgan Pratchett)
- 2018 Presenter: "*The functional diversity and redundancy of corals*", PhD Exit Seminar, ARC Centre of Excellence for Coral Reef Studies; [[video](#)]
- 2017 Session Host: "*Species, traits and Coral Reef Processes*" European Coral Reef Symposium (ECRS), Oxford, United Kingdom.
Presenter: "*Linking coral assemblages to community productivity*", European Coral Reef Symposium (ECRS), Oxford, United Kingdom.
Presenter: "*Regional disparity in the diversity and redundancy of coral functional roles.*" Australian Coral Reef Society (ACRS) Conference, Townsville, Australia.
- 2016 Presenter: "*Functional collapse on Caribbean Coral Reefs.*", International Coral Reef Symposium (ICRS), Honolulu, Hawai'i, USA.

FUNDING

- 2021 Leverhulme Early Career Research Fellowship (GBP 345,378), University of St Andrews
- 2015 JCUPRS Scholarship, Postgraduate Research Scholarship (AUD 204,872)

AWARDS

- 2019 Australian Marine Science Association (AMSA, NQ Division) Award for Research
- 2018 Virginia Chadwick Award for outstanding publication in an international journal
- 2017 Vikki Harriot Award for outstanding conference presentation
- 2012 Brasenose Travel Grant (GBP 500, for coral reef ecology workshop, Bermuda)
Bermuda Institute Of Ocean Sciences Scholarship (GBP 2000)
- 2009 Brasenose Travel Grant (GBP 500, for a research work placement, Indonesia)

RESEARCH EXPEDITIONS

- 2019 [16] Kaneohe Bay, Oahu (Bleaching surveys, multiple surveys over 6 months); [15] Palau (Coral trait variation study, duration: 21 Days)
- 2018 [14] Southern Coral Sea (Coral Sea Monitoring, duration: 20 Days); [13] Orpheus Island (Coral recruitment study, duration: 7 Days); [12] Central Coral Sea (Coral Sea Monitoring, duration: 17 Days)

- 2017 [11] Palm Island Reefs, Great Barrier Reef (AIMs expedition, duration: 10 days), [10] Whitsunday Island Reefs (Coral recruitment study, duration: 6 days); [9] Central Great Barrier Reef (AIMs expedition, duration: 15 days); [8] Orpheus Island, Australia (Reef productivity study, 2 Months)
- 2016 [7] Great Barrier Reef, Cairns to Cooktown (Bleaching Mortality Surveys, duration: 28 days), [6] Heron Island, Great Barrier Reef (Fish behaviour study; duration; 21 days); [5] Opal Reef, Great Barrier Reef (Fish behaviour study; duration: 4 days); [4] Great Barrier Reef, Cairns to Cooktown (Bleaching surveys, duration: 28 days)
- 2015 [3] Palm Island Reefs (Cross-shelf growth study, duration: 7 days), [2] Orpheus Island, Great Barrier Reef (Pre-bleaching surveys; duration: 14 days); [1] Lizard Island, Great Barrier Reef (Fish movement study; duration; 21 days).

TEACHING

- 2021-22 Instructor – Emerging technologies in coral reef conservation, Hawaii Institute of Marine Biology
- 2020 Instructor – Data visualisation in *ggplot2*, R coding workshop for the University of Hawaii Manoa Student Association
- 2019 Co-supervisor for Masters Research Project – *Oxygen Uptake and Ionoregulatory Development in Early Life Stages of Two Coral Reef Fishes* (Leteisha Prescott, JCU).

POLICY REPORTS

- 2017 Briefing to MP's on Great Barrier Reef Bleaching, delivered to MP's at 'Science Meets Parliament' in Canberra, Australia
- 2016 [Advancing Climate Action in Queensland](#) and [Science-based policy plan for the Great Barrier Reef](#), written and submitted to MP's for the Australian Coral Reef Society

OTHER SKILLS & ACTIVITIES

- SCUBA Instructor Marine Science and PADI SCUBA Instructor (15/06/2012-05/01/2015), employed at dive centers in the Caribbean, the Maldives, the Great Barrier Reef, and Southern Australia
- Reviewer Reviewer of manuscripts for *Proceedings of the Royal Society B*, *Functional Ecology*, *Ecology & Evolution*, *Coral Reefs*, *Biological Conservation*, *Marine and Freshwater Research*, and *Biodiversitas*; *Indonesian Journal of Biodiversity*. Reviewer of grant proposals for the National Science Foundation (NSF) and Centre de synthèse et d'analyse sur la biodiversité (CESAB).