

Curriculum Vitae

Dr Catherine Jane Collier BSc (Hons), PhD**Affiliated Scientist**C₂O Consulting**Senior Scientific Officer**

TropWATER James Cook University

[Research portfolio](#)**Synopsis**

I am a coastal ecologist with a particular interest in seagrass eco-physiology. My research is focused on environmental requirements for ecosystem resilience. I conduct long-term monitoring and research to optimize monitoring sensitivity through indicator selection and development of thresholds. I am interested in how global issues, including ocean acidification and thermal stress, interact with local-scale pressures to affect seagrass condition and resilience. I am also experienced in, and passionate about the communication of science to improve research uptake.

Professional history

2007–present. Researcher, James Cook University, Australia

2006–2007. Senior Project Officer, Climate Change Response Programme, Great Barrier Reef Marine Park Authority, Townsville, Australia

1999–2002. Scientific Support Officer and Communications Officer, Moreton Bay Catchments and Waterways Program, Brisbane, Australia

Recent and ongoing research grants

The following are projects in which I have been PI or Co-PI in the last 3 years:

2013–2016 Seagrass growth and diversity: attributes of a resilient GBR, **Great Barrier Reef Foundation**2015–2016 Light thresholds for seagrasses of the GBR: a synthesis and guiding document for managing seagrass, **National Environmental Science Programme TWQ**2015–2016 Developing and refining biological indicators for seagrass condition assessments in an integrated monitoring program, **National Environmental Science Programme TWQ**2011–present Inshore seagrass monitoring for the GBR Marine Monitoring Program, **Great Barrier Reef Marine Park Authority**2013–2015 Investigating the effects of productivity on pH at local scales, **Great Barrier Reef Foundation**2011–2013 Vulnerability of seagrass habitats in the GBR to flood plume impacts: light, nutrients, salinity. **National Environmental Research Program TE Hub****Professional accomplishments**

The following is a brief list of past or current work areas:

Research

- Environmental requirements for healthy coastal ecosystems including: light, herbicides, salinity, nutrients, plume exposure
- Climate change impacts including: ocean acidification and thermal stress
- Interactive and cumulative effects of environmental conditions
- Thresholds and water quality guidelines
- Plant physiology including: net productivity, carbon budgets, internal resource allocation
- Seagrass resilience: development of theoretical frameworks and testing resilience theory through research and monitoring
- Tropical and temperate ecosystems

Monitoring

- Long-term inshore seagrass monitoring in the GBR
- In situ light and turbidity monitoring
- Interpretation of monitoring through resilience concepts
- Integration of seagrass monitoring and water quality data

Science communication

- Science communication including visual synthesis of complex science (conceptual models)
- Translation of scientific findings into management actions for marine, estuarine and freshwater environments.
- Seminars to a range of audiences ranging from international conferences to primary school children

Ecosystem Health and Management

- Risk assessments for management prioritization
- Refinement of indicators of ecosystem health
- Thresholds development through targeted research

Project management and supervision

- Supervision of post-graduate students
- Management of cross-institutional collaborative networks
- Project management

Education

2002-2006. PhD, Environmental Management, Edith Cowan University, Perth, Australia

1995-1999. BSc (Hons), University of Queensland, Brisbane, Australia

Selected publications

Research publications

- Collier, C. J., M. Adams, L. Langlois, M. Waycott, K. O'Brien, P. Maxwell, and L. McKenzie. In Press. Thresholds for morphological response to light reduction for four tropical seagrass species. *Ecological Indicators*.
- Ow, X.Y., S. Uthicke, and C.J. Collier. Light levels affect carbon utilisation in tropical seagrass under ocean acidification. In Press.
- Unsworth, R. K. F., C. J. Collier, M. Waycott, L. J. McKenzie, and L. C. Cullen-Unsworth. 2015. A framework for the resilience of seagrass ecosystems. *Marine Pollution Bulletin* 100: 34-46.
- Ow, Y. X., C. J. Collier, and S. Uthicke. 2015. Responses of three tropical seagrass species to CO₂ enrichment. *Marine Biology* 162: 1-13.
- Takahashi, M., S. H. C. Noonan, K. E. Fabricius, and C. J. Collier. 2015. The effects of long-term in situ CO₂ enrichment on tropical seagrass communities at volcanic vents. *ICES Journal of Marine Science: Journal du Conseil*.
- Wilkinson, A. D., C. J. Collier, F. Flores, and A. P. Negri. 2015. Acute and additive toxicity of ten photosystem-II herbicides to seagrass. *Scientific Reports* 5: 17443.
- Negri, A. P., F. Flores, P. Mercurio, J. F. Mueller, and C. J. Collier. 2015. Lethal and sub-lethal chronic effects of the herbicide diuron on seagrass. *Aquatic Toxicology* 165: 73-83.
- Petus, C., C. J. Collier, M. Devlin, M. Rasheed, and S. McKenna. 2014. Using MODIS data for understanding changes in seagrass meadow health: a case study in the Great Barrier Reef (Australia). *Marine Environmental Research* 137: 163-177.
- Collier, C. J., C. Villacorta-Rath, K.-J. Van Dijk, M. Takahashi, and M. Waycott. 2014. Seagrass Proliferation Precedes Mortality during Hypo-Salinity Events: A Stress-Induced Morphometric Response. *PLoS ONE* 9: e94014.
- McMahon, K. M., C. J. Collier, and P. S. Lavery. 2013. Identifying robust bioindicators of light stress in seagrasses: A review. *Ecological Indicators* 30: 7-15.
- Collier, C. J., M. Waycott, and L. J. McKenzie. 2012. Light thresholds derived from seagrass loss in the coastal zone of the northern Great Barrier Reef, Australia. *Ecological Indicators* 23: 211-219.
- Collier, C. J., M. Waycott, and A. Giraldo-Ospina. 2012. Responses of four Indo-West Pacific seagrass species to shading. *Marine Pollution Bulletin* 65: 342-354.
- Collier, C. J., S. Uthicke, and M. Waycott. 2011. Thermal tolerance of two seagrass species at contrasting light levels: implications for future distribution in the Great Barrier Reef. *Limnology Oceanography* 56: 2200-2210.
- Prado, P., C. J. Collier, J. Romero, and T. Alcoverro. 2011. Distinctive types of leaf tissue damage influence nutrient supply to growing tissues within seagrass shoots. *Marine Biology* 158: 1473-1482.
- Collier, C. J., P. S. Lavery, R. J. Masini, and P. J. Ralph. 2009. Shade-induced response and recovery of the seagrass *Posidonia sinuosa*. *J. Exp. Mar. Biol. Ecol.* 370: 89-103.
- Ralph, P. J., M. J. Durako, S. Enriquez, C. J. Collier, and M. A. Doblin. 2007. Impact of light limitation on seagrasses. *J. Exp. Mar. Biol. Ecol.* 350: 176-193.

Reports

- McKenzie, L., C. J. Collier, L. Langlois, R. L. Yoshida, N. Smith, and M. Waycott. 2016. Marine Monitoring Program: Inshore seagrass annual report for the sampling period 1st June 2014-31st May 2015. Great Barrier Reef Marine Park Authority.
- McKenzie, L., C. J. Collier, L. Langlois, R. L. Yoshida, N. Smith, M. Takahashi, and M. Waycott. 2015. Marine Monitoring Program: Inshore seagrass annual report for the sampling period 1st June 2013 - 31st May 2014. Great Barrier Reef Marine Park Authority.
- Collier, C. J., M. Devlin, L. Langlois, L. J. McKenzie, C. Petus, E. Teixeira Da Silva, K. McMahon, M. Adams, K. O'Brien, J. Statton, and M. Waycott. 2015. Final report on Thresholds and indicators of declining water quality as tools for tropical seagrass management. A summary of findings from Project 5.3 Vulnerability of seagrass habitats in the GBR to flood plume impacts: light, nutrients, salinity, p. 46. Report to the National Environmental Research Program. Reef and Rainforest Research Centre Limited, Cairns.
- Brodie, J., J. Waterhouse, B. Schaffelke, M. Furnas, J. Maynard, C. Collier, S. E. Lewis, M. Warne, K. Fabricius, M. J. Devlin, L. McKenzie, H. Yorkston, L. Randall, J. Bennett, and V. E. Brando. 2013. Relative risks to the Great Barrier Reef from degraded water quality. Synthesis of evidence to support the Reef Water Quality Scientific Consensus Statement 2013. Department of the Premier and Cabinet, Queensland Government.
- Schaffelke, B., K. R. N. Anthony, J. Blake, J. Brodie, C. Collier, M. J. Devlin, K. Fabricius, K. Martin, L. McKenzie, A. Negri, M. Ronan, A. Thompson, and M. Warne. 2013. Marine and coastal ecosystem impacts. Synthesis of evidence to support the Reef Water Quality Scientific Consensus Statement 2013. Department of the Premier and Cabinet, Queensland Government.

- Collier, C., and M. Waycott. 2009. Drivers of change to seagrass distributions and communities on the Great Barrier Reef: Literature review and gaps analysis. Report to the Marine and Tropical Sciences Research Facility. Reef and Rainforest Research Centre Limited.

Book chapters

- Waycott, M., L. J. McKenzie, J. E. Mellors, J. C. Ellison, M. T. Sheaves, C. Collier, A.-M. Schwarz, A. Webb, J. Johnson, and C. E. Payri. 2011. Vulnerability of mangroves, seagrasses and intertidal flats in the tropical Pacific to climate change. In J. D. Bell, J. E. Johnson and A. J. Hobday [eds.], *Vulnerability of Tropical Pacific Fisheries and Aquaculture to Climate Change*. Secretariat of the Pacific Community.
- Waycott, M., C. J. Collier, K. McMahon, P. Ralph, L. J. McKenzie, J. W. Udy, and A. Grech. 2007. The vulnerability of seagrasses of the Great Barrier Reef to climate change. In J. Johnson and P. Marshall [eds.], *Climate change and the Great Barrier Reef: a vulnerability assessment*. Great Barrier Reef Marine Park Authority.

Books (as science communicator)

- Abal, E. G., S. E. Bunn, and B. Dennison. 2005. *Healthy Waterways-Healthy Catchments*. Moreton Bay Waterways and Catchments Partnership.
- Dennison, W. C., and E. G. Abal. 1999. *Moreton Bay Study: A scientific basis for the Healthy Waterways campaign*. HealthyWaterways.