

Kristen T. Brown, PhD

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EDUCATION

- 2018 Doctor of Philosophy (Ph.D.) Marine Sciences
University of Queensland
Thesis title: The dynamics of coral-algal interactions on coral reef ecosystems
Supervisors: Prof Ove Hoegh-Guldberg, A/Prof Sophie Dove and Prof Cath Lovelock
- 2012 Bachelors of Science (Honours) Marine Biology
University of California, Santa Cruz

ACADEMIC APPOINTMENTS

- Postdoctoral Scholar (October 2020–*present*)
University of Pennsylvania, Department of Biology | Advisor: Katie Barott
Coral physiology and cell biology
- Associate Research Fellow (October 2020–*present*)
University of Queensland, School of Biological Sciences
- Postdoctoral Research Fellow (June 2018– October 2020)
University of Queensland, School of Biological Sciences | Advisor: Sophie Dove
Coral reef ecology and biogeochemistry in a changing climate

RESEARCH GRANTS AWARDED

Total income awarded as principle investigator: \$98,799

Early career

- Winifred V. Scott Charitable Trust Conservation Grant (2019–2022) *Species interactions and reef recovery in the aftermath of mass coral bleaching*. \$80,000 PI Brown, PI Radice, PI Dove
- National Geographic Society Early Career Research Award (2019–2020) *Species interactions and reef recovery in the aftermath of mass coral bleaching*. \$9,999 PI Brown

Graduate

- Holsworth Wildlife Research Endowment (2017) *Effects of varying environmental conditions on the ecophysiology of coral-algal interactions*. \$1,700 PI Brown
- Holsworth Wildlife Research Endowment (2016) *Investigating environmental drivers and their effects on coral-algal ecological interactions*. \$4,000 PI Brown
- PADI Foundation Research Grant (2016) *The future of competitive coral reef dynamics: effects of ocean warming and acidification on coral-algal interactions*. \$3,100 PI Brown

PEER-REVIEWED PUBLICATIONS

First-authored: 7 | h-index: 4 | citations: 93 | [corresponding author](#) | *indicates student/mentee

15. Rathbone, M.*, Brown K.T., and Dove, S. Tolerance to a highly variable environment does not infer resilience to future ocean warming and acidification in a branching coral. *In revision*. Limnology and Oceanography.
14. Innis, T., Allen-Waller L., Brown, K.T., Sparagon, W., Carlson, C., Kruse, E., Huffmyer, A.S., Nelson, C.E., Putman, H.M., and Barott, K.L. (2021) Marine heatwaves depress metabolic activity and impair cellular acid-base homeostasis in reef-building corals regardless of bleaching susceptibility. *Global Change Biology*. <https://doi.org/10.1111/gcb.15622>

13. Brown, K.T., Bender-Champ, D., Achlatis, M., van der Zande, R., Kubicek, A., Martin, S.B., Castro-Sanguino, C., Dove, S., and Hoegh-Guldberg, O. (2021) Habitat-specific biogenic production and erosion influences net framework and sediment coral reef carbonate budgets. *Limnology and Oceanography*. 2, 66 349-365. <https://doi.org/10.1002/lno.11609>
12. Dove, S., Brown, K.T., van den Heuval, A., Chai, A. and Hoegh-Guldberg, O. (2020). Ocean warming and acidification uncouple calcification from calcifier biomass which accelerates coral reef decline. *Communications Earth & Environment* 1, 55 . <https://doi.org/10.1038/s43247-020-00054-x>
11. Brown K.T., Bender-Champ D., Hoegh-Guldberg, O., and Dove S. (2020). Seasonal shifts in the competitive ability of macroalgae influence the outcomes of coral-algal competition. *Royal Society Open Science*. <https://doi.org/10.1098/rsos.201797>
10. Martin, S.M., Brown, K.T., and Hoegh-Guldberg, O. (2020) Southernmost observation of juvenile bumphead parrotfish *Bolbometopon muricatum* (Valenciennes, 1840). *Australian Journal of Zoology*. <https://doi.org/10.1071/ZO20029>
9. Kennedy, E.V., Vercelloni, J., Neal, B.P., Ambariyanto, Bryant, D.E.P., Ganase, A., Gartrell P., Brown, K.T. et al. (2020) Coral reef community changes in Karimunjawa National Park, Indonesia: assessing the efficacy of management in the face of local and global stressors. *Journal of Marine Science and Engineering*. 8 (10), 760; <https://doi.org/10.3390/jmse8100760>
8. Rodriguez-Ramirez, A., González-Rivero, M., Beijbom, O., Bailhache, C., Bongaerts, P., Brown K.T., Bryant, D.E.P., Dalton, P., Dove, S., Ganase, A., Kennedy, E.V., Kim, C.J.S., Lopez-Marcano, S., Neal, B.P., Radice, V.Z., Vercelloni, J., Beyer, H.L., and Hoegh-Guldberg, O. (2020) A contemporary baseline record of the world's coral reefs. *Scientific Data* 7, 355; <https://doi.org/10.1038/s41597-020-00698-6>
7. González-Rivero, M., Rodriguez-Ramirez, A., Beijbom, O., Dalton, P., Kennedy, E.V., Neal, B.P., Vercelloni, J., Bongaerts, P., Ganase, A., Bryant, D.E.P, Brown, K.T., Kim, C.J.S., Lopez-Marcano, S., Dove, S., Bailhache, C., Beyer, H.L., Hoegh-Guldberg, O. (2020) Seaview Survey Photo-quadrat and Image Classification Dataset. The University of Queensland. Data Collection. <https://doi.org/10.14264/uql.2019.930>
6. Brown, K.T., Bender-Champ, D., Kenyon, T. M.*, Rémond, C.*, Hoegh-Guldberg, O., & Dove, S. (2019) Temporal effects of ocean warming and acidification on the mechanisms of coral-algal competition. *Coral Reefs*. <https://doi.org/10.1007/s00338-019-01775-y>
5. Brown, K.T. (2019) Can restored sea urchin populations save coral reefs from algae invasion? *Limnology and Oceanography Bulletin*. <https://doi.org/10.1002/lob.10319>
4. Brown K.T., Bender-Champ D., Kubicek A., van de Zande R., Achlatis M., Hoegh-Guldberg O. & Dove S.D. (2018) The dynamics of coral-algal interactions in space and time on the southern Great Barrier Reef. *Frontiers in Marine Science*. <https://doi.org/10.3389/fmars.2018.00181>
3. Brown, K.T. (2018) The dynamics of coral-algal interactions on coral reef ecosystems. The University of Queensland. PhD thesis.
2. Brown K.T., Bender-Champ D., Bryant D.E.P., Dove S. & Hoegh-Guldberg O. (2017) Human activities influence benthic community structure and the composition of coral-

algal interactions in the central Maldives. *Journal of Experimental Marine Biology and Ecology*. <https://doi.org/10.1016/j.jembe.2017.09.006>.

1. Bryant D.E.P., Rodriguez-Ramirez A., Phinn S., Gonzalez-Rivero M., Brown K.T., Neal B.P., Hoegh-Guldberg O. & Dove S. (2017) Comparison of two photographic methodologies for collecting and analyzing the condition of coral reef ecosystems. *Ecosphere*. <https://doi.org/10.1002/ecs2.1971>

CONFERENCE PRESENTATIONS

- 2020 Brown, K.T., Hoegh-Guldberg, O. and Dove, S. Biotic mitigation of ocean acidification does not enhance net ecosystem calcification under multiple stressors. 14th International Coral Reef Symposium (ICRS). *Cancelled due to COVID-19*
- 2019 Dove, S., Brown, K.T., van den Heuval, A., Chai, A. and Hoegh-Guldberg, O. Acidification is critically important to any conversation regarding reef futures. Australian Coral Reef Society 89th Annual Meeting.
Brown, K.T., Bender-Champ, D., Achlatis, M., van der Zande, R., Kubicek, A., Martin, S.B., Dove, S., and Hoegh-Guldberg, O. Differential carbonate budgets shape geomorphological zones on a platform coral reef. Australian Coral Reef Society 89th Annual Meeting.
Brown, K.T., Bender-Champ, D., Achlatis, M., van der Zande, R., Kubicek, A., Martin, S.B., Dove, S., and Hoegh-Guldberg, O. Differential carbonate budgets shape geomorphological zones on a platform coral reef. *Limnology and Oceanography Aquatic Sciences Meeting*.
- 2018 Brown, K.T., Bender-Champ, D., Kubicek, A., van der Zande, R., Achlatis, M., Hoegh-Guldberg, O., and Dove, S. The dynamics of coral-algal interactions in space and time on the southern Great Barrier Reef. Australian Marine Science Association. *Best student presentation award*.
- 2017 Brown, K. T., Bender-Champ, D., Kenyon, T., Rémond, C., Hoegh-Guldberg, O., & Dove, S. Effects of ocean warming and acidification on the ecophysiology of a common coral-algal interaction. *Ecological Society of America*.
Bryant, D.E.P., Rodriguez-Ramirez, A., Phinn, S., González-Rivero, M., Brown, K. T., Neal, B.P., Hoegh-Guldberg, O., & Dove, S. Comparison of methodologies for collecting and analyzing the condition of coral reef ecosystems. Australian Coral Reef Society.
Brown, K. T., Bender-Champ, D., Kenyon, T., Rémond, C., Hoegh-Guldberg, O., & Dove, S. Effects of ocean warming and acidification on the ecophysiology of a common coral-algal interaction. Australian Marine Science Association.
- 2016 Bender-Champ, D., Kubicek, A., Achlatis, M., van der Zande, R., Brown, K.T., Hoegh-Guldberg, O., & Dove, S. Temporal changes in the productivity and calcification of slope and lagoonal communities on a platform reef. 13th International Coral Reef Symposium (ICRS).
Brown, K. T., Bender-Champ, D., Kenyon, T., Hoegh-Guldberg, O., & Dove, S. The future of competitive coral reef dynamics: effects of elevated temperatures and ocean acidification on the physiology of *Acropora-Halimeda* interactions. 13th International Coral Reef Symposium (ICRS).

TEACHING EXPERIENCE

Teaching Assistant

STCRE Australian Coastal Studies Program, *Stanford University* (2015–2019)

CONST024 Master of Marine Conservation, *University of Queensland* (2018–2019)
MARS2005 Australia's Marine Environment, *University of Queensland* (2015–2019)
BIOL3023 Tropical Marine Ecosystems, *University of Queensland* (2016–2017)

Guest Lectures

GEV4320 Ocean's in the Anthropocene, *Villanova University* (Spring 2021)
Coral reefs under climate change
MARS2005 Australia's Marine Environment, *University of Queensland* (Spring 2019)
Statistical Methods in Ecology using R
CONST024 Master of Marine Conservation, *University of Queensland* (Summer 2019)
Coral physiology in a changing climate
STCRE Australian Coastal Studies Program, *Stanford University* (Fall 2019)
Marine plants and photosynthesis
CONST024 Master of Marine Conservation, *University of Queensland* (Summer 2018)
Coral physiology in a changing climate

Supervision

Postgraduate

Vanessa Clark (2019- *present*) Doctor of Philosophy, *University of Queensland*
Coral growth dynamics and small-scale population genetics
Joint supervision with Sophie Dove, Cynthia Ryginos
Michaela Rathbone (2019-2020) Bachelors of Science (Honours), *University of Queensland*
The influence of origin dependent physiological trade-offs on the survivorship and resilience of Isopora palifera to future climate change
Joint supervision with Sophie Dove

Undergraduate research projects

- Grace Wall (2019-2020) Bachelors of Science (Honours), *University of Queensland*
Physiological trade-offs of Acropora from environmentally distinct habitats
- Will Hooks (2 weeks, October 2019) Heron Island Research Station, *Stanford University*
Sea hare (Aplysia dactylomela) macroalgal preference and feeding rates
- Jordan Ferre (2 weeks, October 2019) Heron Island Research Station, *Stanford University*
Sea hare (Dolabella auricularia) macroalgal preference and feeding rates
- Osana Drake (2 weeks, October 2018) Heron Island Research Station, *Stanford University*
Effects of light and temperature on macroalgal palatability
- Cole Shepard (2 weeks, October 2018) Heron Island Research Station, *Stanford University*
Effects of light and temperature on macroalgal palatability
- Chidinma (Angela) Umeh (2 weeks, October 2017) Heron Island Research Station, *Stanford University*
Effects of ocean warming and acidification on the physiology of coral-algal interactions
- Mark Buckup (2 weeks, October 2017) Heron Island Research Station, *Stanford University*
Effects of macroalgal contact on coral physiology
- Shayna Blue (2 weeks, October 2016) Heron Island Research Station, *Stanford University*
Influence of branch position on mycosporine-like amino acids in Acropora
- Cheyenne Peltier (2 weeks, October 2016) Heron Island Research Station, *Stanford University*
Influence of coral coloration on mycosporine-like amino acids in Acropora

- Tynan Challenor (2 weeks, October 2015) Heron Island Research Station, Stanford University *Sea cucumber feeding and excretion on the reef flat*
- Megan Good (2 weeks, October 2015) Heron Island Research Station, Stanford University *Sea cucumber feeding and excretion on the reef flat*

Mentoring

Graduate students mentored

- Tania Kenyon (2016–2020) Heron Island Research Station, University of Queensland
- Matheus Mello-Athayde (2020-2021) Heron Island Research Station, Lizard Island Research Station, University of Queensland

Research volunteers mentored

- Tysen Bravo (1 month, March 2021) Heron Island Research Station
- Jennifer McWhorter (3 weeks, February 2021) Heron Island Research Station
- Ellie Bergstrom (2 weeks, March 2020) Lizard Island Research Station
- Tysen Bravo (2 weeks, March 2020) Lizard Island Research Station
- Maureen Ho (2 weeks, March 2020) Lizard Island Research Station
- Devin Rowell (2 months, January–March 2020) University of Queensland
- Ali Copeland (3 weeks, December 2019) Heron Island Research Station
- Angela Stern (1 month, September 2017) University of Queensland
- Camille Rémond (2 months, June–August 2015) Heron Island Research Station

Research technicians mentored

- Aaron Chai (3 weeks, January 2021) Heron Island Research Station
- Adriana Campili (3 weeks, August 2020) Heron Island Research Station

FIELD EXPERIENCE

Shore-based

- 2021 Heron Island, Great Barrier Reef (3 months) – lead research scientist, University of Pennsylvania
- 2020 Heron Island, Great Barrier Reef (3 weeks) – lead research scientist and scientific diver, University of Queensland, National Geographic Society
Lizard Island, Great Barrier Reef (3 weeks) – lead research scientist and scientific diver, University of Queensland, National Geographic Society
- 2019 Heron Island, Great Barrier Reef (3 weeks) – lead research scientist and scientific diver, University of Queensland, National Geographic Society
Lizard Island, Great Barrier Reef (3 weeks) – lead research scientist and scientific diver, University of Queensland, National Geographic Society
- 2018 Heron Island, Great Barrier Reef (1 week) – lead research scientist, University of Queensland
- 2016 Heron Island, Great Barrier Reef (5 months: 3 week–2-month long expeditions throughout 2016) – research scientist and scientific diver, University of Queensland
- 2015 Heron Island, Great Barrier Reef (5 months: 3 week–2-month long expeditions throughout 2015)- research scientist and scientific diver, University of Queensland
- 2014 Solomon Islands (3 weeks)- scientific diver and data manager, XL Catlin Seaview Survey and Khaled bin Sultan Living Ocean Foundation

- Bunaken National Park, Indonesia (20 days)- scientific diver and data manager, XL Catlin Seaview Survey
 Heron Island, Great Barrier Reef (3 months: 2–4 week-long expeditions throughout 2014) – research scientist and scientific diver, University of Queensland
 2012 Bodega Bay, CA (2 weeks) – scientific diver, Stanford University and California Department of Fish and Game

Sea time

- 2018 Tubbataha Natural Marine Park, Philippines (7 days) – scientific diver and data manager Paul G. Allen Coral Triangle re-survey
 2017 central Maldives (3 weeks) – research scientist and scientific diver, XL Catlin Seaview Survey, deep team (30m)
 2015 central Maldives (3 weeks) – research scientist and scientific diver, XL Catlin Seaview Survey
 Chagos, British Indian Ocean Territory (3 weeks) – scientific diver and data manager, XL Catlin Seaview Survey and Chagos Conservation Trust
 2014 Western Province, Solomon Islands (3 weeks) – scientific diver and data manager, XL Catlin Seaview Survey and Khaled bin Sultan Living Ocean Foundation
 Sangihe Islands, Indonesia (7 days) – scientific diver and data manager, XL Catlin Seaview Survey
 Timor Leste (14 days) – scientific diver and data manager, XL Catlin Seaview Survey
 Tubbataha Natural Marine Park, Philippines (7 days) – scientific diver and data manager, XL Catlin Seaview Survey
 2012 California and Oregon coasts (3 weeks)- fisheries biologist, National Oceanic and Atmospheric Administration (NOAA)

ACADEMIC AWARDS AND SCHOLARSHIPS

Doctoral

- 2018 Diversity Journal Award for best student presentation in coral reef research (\$400)
 2017 Ecological Society of America student travel award (\$150)
 International Phycological Society Paul C. Silva travel award (2017) \$500
 ARC Center of Excellence for Coral Reef Studies photography award (\$250)
 2016 University of Queensland School of Biological Sciences travel award (\$1600)
 ARC Center of Excellence for Coral Reef Studies travel award (\$1,000)
 2014–2017 University of Queensland International Scholarship (\$160,000)
 XL Catlin Oceans Scholar Scholarship (\$106,728)

Undergraduate

- 2012 National Science & Mathematics Access to Retain Talent (SMART) (\$4,000)
 2011 National Science & Mathematics Access to Retain Talent (SMART) (\$4,000)

PROFESSIONAL SERVICE

Peer reviewer

Global Change Biology | Proceedings of the Royal Society B: Biological Sciences | Ecography | Biological Conservation | Diversity and Distributions| Marine Environmental Research | Aquatic Ecology | Marine and Freshwater Research | Journal of Marine Biology and Ecology | Marine Pollution Bulletin

Conference organization

- 2022 Legacy effects of marine heatwaves on coral reef ecosystems. ASLO Ocean Sciences Meeting *proposed*
- 2020 Beyond single species experiments: how do marine populations, communities, and ecosystems respond to global climate change? International Coral Reef Symposium
Cancelled due to COVID19, rescheduled for 2021

Department service

2020–2021 Heron Island Research Station Advisory Committee, University of Queensland

MEDIA AND OUTREACH

Film

- Life at 50°C, BBC documentary (2021)
- UNESCO World's Ocean Day: Gender in Science (2019)

Podcast/radio

- Field Trials: early career researchers recount the unexpected highs and lows of collecting field data, Collateral (2018)
- The dynamics of coral-algal interactions in space and time on the southern Great Barrier Reef, 4CC Gladstone (2018)

Author

- Coasts drown as coral reefs collapse under warming and acidification (2020), UQ news
- Improving estimates of coral reef carbonate budgets using habitat-specific rates (2020), UQ news
- Mutually-assured destruction in heated coral-algae war (2019), UQ news
- Field Trials: early career researchers recount the unexpected highs and lows of collecting field data, Lateral (2018)
- Combination of temperature and light naturally regular macroalgae abundance (2018), UQ news
- What's happening in the south? (2017), Australian Coral Reef Society newsletter
- Algae on the reef: Gauging reef health by overlooked species, IUCN Maldives Marine Report
- XL Catlin Seaview Survey news and blog (2014-2016)

MEMBERSHIPS

Professional Societies

Australian Coral Reef Society 2014–*present*

International Coral Reef Society 2016–*present*

Association for the Sciences of Limnology and Oceanography 2018–*present*

CERTIFICATIONS

Diving

American Academy of Underwater Sciences (AAUS) Scientific Diver (2010)
TDI Diver Propulsion Vehicle, NAUI Master SCUBA Diver, NAUI EANx Diver, SSI Stress and Rescue Diver, NAUI Advanced Diver, NAUI SCUBA Diver

Boating

Recreational Marine Boat License, Marine Radio Operators License

First aid and medical

Administering First Aid, Advanced Resuscitation, ADAS Dive Medical