

Dr Caitlin D. Kuempel

Post-doctoral Fellow · University of Queensland, Brisbane, Australia

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Education

The University of Queensland, PhD Conservation Science, St. Lucia, QLD, Australia Nov. 2014- Aug. 2018

Northeastern University, M.S. Marine Biology, Nahant, MA Dec. 2013

University of Iowa, B.S. Environmental Bioscience (with honors), B.A. French, Certificate in Sustainability, Honors in coral morphometrics, Iowa City, IA May 2012

Professional Experience

Post-doctoral Fellow, ARC Centre of Excellence for Coral Reef Studies, UQ, Brisbane, Australia Feb. 2020-present > Exploring ways to manage and monitor climate resilient reefs to benefit people and nature as part of the World Wildlife Fund's Coral Reef Rescue Initiative

Post-doctoral Fellow, NCEAS, Santa Barbara, CA Sept. 2018-Dec. 2019 > Quantified, compared and mapped the production and environmental impacts of all major food systems as part of a collaborative working group

Conservation Planning Consultant, IUCN and The University of Queensland July-Aug.2018 > Collated data and developed conservation plans for four Pacific Island nations using the spatial conservation planning software, Marxan.

Volunteer Researcher: University of Queensland and WWF Indonesia Sept.-Oct. 2016 > Led analyses and helped organize workshops to find priority regions for marine conservation in the Sunda Banda Seascape of Indonesia.

Research Assistant: Smithsonian Tropical Research Institute, Bocas del Toro, Panama April-Oct. 2014 > Thalassia testudinum Experimental Network (TEN): investigated the impacts of nutrients and grazer abundance on seagrass across a latitudinal gradient (Florida, Belize, Panama).

Conservation Intern: Central Caribbean Marine Institute, Little Cayman, Cayman Islands Jan.-April 2014 > Assisted with lionfish management research, coral nursery, and climate data collection. Provided weekly educational talks and tours to guests and tourists.

Short-Term Fellow: Smithsonian Tropical Research Institute, Bocas del Toro, Panama June-Dec. 2013 > Investigated the role of consumers in coral-algal community dynamics under the supervision of Dr. Andrew Altieri.

Research Assistant: University of Iowa Department of Geoscience, Iowa City, IA May 2009-2010

Grants and Awards

- CBCS Small Grants Scheme (\$4,500 across three successful proposals) (2021)
- University of Queensland Faculty of Science Awards Rising Star - Academic category Finalist (Dec. 2020)
- APEC Science Prize for Innovation, Research and Education Award - shortlisted for Australian nominee (2020)
- University of Queensland Dean's Award for Outstanding HDR Theses (2018)
- ARC Laureate Postgraduate Scholarship (\$119,376 over 4 years) Nov 2014-2018
- Seafood Footprint Displacement Top-up Scholarship (Dr. Carissa Klein, \$5,000) March-June 2018
- 50 Reefs Top-up Scholarship (\$5,000) Sept. 2017
- University of Queensland Career Development Award (\$5,000) May 2017
- Taylor and Francis University of Queensland Library Excellence Award in Research (\$1,000) May 2017
- Smithsonian Tropical Research Institute Short-Term Fellowship (\$2,000) June-Nov. 2013

Peer-Reviewed Publications

1. Almaraz, M., Kuempel, C.D., Salter, A., Houlton, B.Z., Halpern, B.S. (accepted). The impact of excessive protein consumption on human wastewater nitrogen loading of US waters. *Frontiers in Ecology and the Environment*
2. Clawson, S.G., Blasco, G., Kuempel, C.D., Froehlich, H.E., Cottrell, R.S., Metian, M., Tobben, J., Williams, D.R., Nash, K.L., Frazier, M., Verstaen, J., Halpern, B.S. (2022). Mapping the spatial distribution of global mariculture production. *Aquaculture*
3. Williams, B.A., Watson, J.E.M., Beyer, H.L., Klein, C.J., Montgomery, J., Runting, R.K., Roberson, L.A., Halpern, B.S., Grantham, H.S., Kuempel, C.D., Frazier, M., Venter, O., Wenger, A. (2021). The global rarity of intact coastal regions. *Conservation Biology*
4. Kuempel, C.D., Simmons, B.A., Davey, M. (2022) Assessing the status of existing and tentative marine natural World Heritage areas reveals opportunities to better achieve World Heritage Convention goals. *Journal of Environmental Management*
5. Kuempel, C.D., Tulloch, V.J.D., Giffin, A.L., Simmons, B.A., Hagger, V., Phua, C. and Hoegh-Guldberg, O. (2021). Identifying management opportunities to combat climate, land and marine threats across less climate exposed coral reefs. *Conservation Biology*
6. Roberson, L., Beyer, H.L., O'Hara, C., Watson, J.E.M., Dunn, Daniel, Klein, C.J., Frazier, M., Kuempel, C.D., Williams, B., Grantham, H., Montgomery, J., Kark, S., Runting, R.K. (2021). Multinational coordination required for conservation of at least 90% of marine species. *Global Change Biology*
7. Kuempel, C.D., Chauvenet, A.L.M., Symes, W.S., Possingham, H.P.P. (2021). Predicted protected area downsizing decreases habitat representation across terrestrial ecoregions in the tropics and subtropics. *Conservation Science and Practice*
8. Suarez-Castro, A.F., Beyer, H.L., Kuempel, C.D., Linke, S., Borelli, P., Hoegh-Guldberg, O. (2021). Global forest restoration opportunities to foster coral reef conservation. *Global Change Biology*
9. Cottrell, R.S., Metian, M., Froehlich, H.E., Blanchard, J.L., Jacobsen, N.S., McIntyre, P.B., Nash, K.L., Williams, D.R., Bouwman, L., Gephart, J.A., Kuempel, C.D., Moran, D.D., Troell, M., Halpern, B.S. (2021) Time to rethink trophic levels in aquaculture policy. *Reviews in Aquaculture*
10. Kuempel, C.D., Froehlich, H.E., Halpern, B.S. (2021) An informed though experiment exploring the potential for a paradigm shift in aquatic food production. *Ocean and Coastal Management*
11. Adams, V.M., Dimitrova, N., Possingham, H.P., Allan, J.R., Kuempel, C.D., Peterson, N., Kaiye, A. Keako, M., Tulloch, V.J.D. (2021) Scheduling incremental actions to build a comprehensive national protected area network for Papua New Guinea. *Conservation Science and Practice*
12. Chauvenet, A.L.M., Watson, J.E.M., Adams, V.M., Di Marco, M., Venter, O., Davis, K.J., Mapping, B., Klein, C.J., Kuempel, C.D., Possingham, H.P. (2020). To achieve big wins for conservation, prioritise protection of ecoregions closest to meeting targets. *One Earth*
13. Kuempel, C.D., Frazier, M., Nash, K.L., Sand Jacobsen, N., Williams, D.R., Blanchard, J.L., Cottrell, R.S., McIntyre, P.B., Moran, D., Bouwman, L., Froehlich, H.E., Gephart, J.A., Metian, M., Tobben, J., Halpern, B.S. (2020). Integrating life-cycle and impact assessments to map food's cumulative environmental footprint. *One Earth*
14. Daigle, R., Metaxas, A., Balbar, A., McGowan, J., Trembl, E., Kuempel, C.D., Possingham, H., Beger, M. (2020). Operationalizing ecological connectivity to identify spatial conservation priorities with Marxan Connect. *Methods in Ecology and Evolution*
15. Kuempel, C.D., Chauvenet, A.L.M., Possingham, H.P., Adams, V.M. (2020). Evidence-based guidelines for prioritizing investments to meet international conservation objectives. *One Earth*
16. Halpern, B.S., Blanchard, J.L., Bouwman, L., Cottrell, R.S., Froehlich, H.E., Gephart, J.A., Sand Jacobson, N., Kuempel, C.D., McIntyre, P.B., Metian, M., Moran, D., Nash, K.L., Tobben, J., Williams, D.R. (2019). Opinion: Putting all food on the same table: Achieving sustainable food systems requires full accounting. *Proceedings of the National Academy of Sciences*
17. Kuempel, C.D., Jones, K.J., Watson J.E.M., Possingham, H.P. (2019). Quantifying biases in placement of marine protected areas relative to abatable biodiversity threats. *Conservation Biology*
18. Jantke, K., Kuempel, C.D., McGowan, J.M., Chauvenet, A.L.M., Possingham, H.P. (2018). Metrics for evaluating representation target achievement in protected area networks. *Diversity and Distributions*
19. Jones, K.J., Klein, C.J., Halpern, B.S., Venter, O., Grantham, H., Kuempel, C.D., Shumway, N., Friedlander, A.M., Possingham, H.P., Watson, J.E.M. (2018). The location and protection status of Earth's

- diminishing marine wilderness. *Current Biology*
20. Kuempel, C.D., Adams, V.M., Possingham H.P., Bode M. (2018) Bigger or better: the relative benefits of protected area network expansion and enforcement for the conservation of an exploited species. *Conservation Letters*
 21. Campbell, J.E., Altieri, A.H., Johnston, L., Kuempel, C.D., Paperno, R., Paul, V.J., Duffy, J.E. (2018) Herbivore community determines the magnitude and mechanism of nutrient effects on subtropical and tropical seagrass. *Journal of Ecology*
 22. Chauvenet, A.L.M., Kuempel C.D., McGowan J., Beger, M., Possingham, H.P. (2017). Methods for calculating Protection Equality for conservation planning. *PloS one*
 23. Kuempel, C.D. and Altieri A. H. (2017). The emergent role of small-bodied herbivores in pre-empting phase shifts on degraded coral reefs. *Scientific Reports*
 24. Kuempel, C.D., Chauvenet, A.L.M., and Possingham H.P. (2016). Equitable representation of ecoregions is slowly improving despite strategic planning shortfalls. *Conservation Letters*
 25. Nelson, H.R., Kuempel, C.D., and Altieri, A.H. (2016). The resilience of reef invertebrate biodiversity to coral mortality. *Ecosphere*

Other Publications

Wakwella, A., Wenger, A., Kuempel, C.D., et al. (2022) Managing Watersheds for Coral Reefs and Public Health. A Vibrant Oceans Initiative Whitepaper.

Kuempel C.D. and Alyssa Giffin (2021) Resilient reefs, resilient communities: how can we get there? *Catchment to Coast*

Kuempel C.D., McGowan J., Estradivari, Handaynai C., Daniel D., Possingham H., Ahmadia, G. (2017) Conservation priority gaps in the Sunda Banda Seascape, Indonesia

Kuempel C.D., Di Marco M., Watson J., Possingham H. (2017). Achieving the targets of global conventions. *Decision Point*

Select presentations

* oral presentation, † invited presentation

Kuempel C (2021) Informing management across less-climate exposed coral reefs. *International Congress on Conservation Biology*, on-line*

Kuempel C† (2020) The basics of protected area design and evaluation. *University of Queensland Twilight Talk Series*, on-line*

Kuempel C† (Nov. 2020) Getting Started with GitHub in R. *Pete Mumby lab group meeting*, UQ*

Kuempel C† (Oct. 2020) Workflows and best practices for collaborative coding. *RLadies Brisbane*, online*

Kuempel C† (Sept. 2020) Getting Started with GitHub in R. *RLadies Brisbane*, online*

Kuempel C† (2020) Coral Reef Rescue Initiative: A climate-centric approach for management coral reefs for nature and people. *Interanational Marine Conservation Congress*, on-line*

Kuempel C, Adams V, Possingham H, Bode M (2018) Bigger or better: the relative benefits of MPA expansion and enforcement. *Society for Conservation Biology Oceania Conference*, Wellington, New Zealand*

Kuempel C, Jones K, Watson J.E., Possingham H (2018) Global marine protected area establishment largely avoids abatable threats to biodiversity. *International Marine Conservation Congress*, Kuching, Malaysia*

Kuempel C, Adams V, Possingham H, Bode M (2017) Bigger or better: the relative benefits of MPA expansion and enforcement. *4th International Marine Protected Areas Congress*. La Serena, Chile*

Kuempel C, Jones K, Watson J.E., Possingham H (2017) Are marine protected areas tackling threats? *International Congress on Conservation Biology*, Cartagena, Colombia*

Kuempel C, Chauvenet A, Possingham H (2016) Does rapid protected area expansion impact the ecological representation of reserve networks? *Society for Conservation 4th Oceania Congress*, Brisbane, Australia*

Kuempel C, Bode M, Adams V, Possingham H (2016) Balancing area and effectiveness: MPA expansion vs. management enforcement in meeting global conservation targets. *International Coral Reef Symposium*, Honolulu, HI*

Teaching Experience

ENVM2002/7002 Marine and Coastal Environmental Protection, University of Queensland, August 2021
ENVM3220/7202 Conservation Planning and Management, University of Queensland, March 2021
WWF Structured Decision Making Training, online, April-May 2021
ENVM2002/7002 Marine and Coastal Environmental Protection, University of Queensland, August 2020
Software Carpentries Instructor Sept. 2020
CONS7021 Masters conservation decision-making course, University of Queensland June 2017, 2018
Moreton Bay Research Station Science Camp, University of Queensland Oct. 2017-June 2018
BIOL3000 Third year conservation course, University of Queensland Aug. 2017
Spatial planning and decision-science workshop, Bogota, Colombia July 2017
Stanford University Bing Overseas Program, University of Queensland Nov. 2017
R for beginners, WWF Indonesia Jakarta office Oct. 2016
Spatial planning for marine protected area design, Bali, Indonesia Oct. 2016
MARS2005 Australia's Marine Environments second year course, University of Queensland May 2016

Service Roles

Academic

- RLadies Brisbane organising Committee
- CBCS Coding Club co-founder and organiser
- Software Carpentries instructor
- Centre for Biodiversity and Conservation Science Management Committee (2021-Present), Early Career Researcher Education Lead
- UNEP MPA Toolbox and Learning Platform (2021)
- NCEAS Diversity Team representative (2018-2019)
- Reviewer for international publications
- Society for Conservation Biology University of Queensland/Brisbane Chapter (2015-2017)
- Reef Life Survey (2017)
- PhD seminar series, The University of Queensland, St. Lucia, QLD, Australia (2014-2015)
- Queensland Catch a Rising Star Program, Queensland National Science Week (2016)

Professional Membership

Reef Life Survey, Australian Coral Reef Society, Society for Conservation Biology, International Society for Reef Studies, World Commission on Protected Areas Young Professionals Group

Supervision

- Emma Arnett, Master's Student (2020-2021): Quantifying like-for-like global seafood trade supervised by Carissa Klein and myself
- Ella Sinclair, Volunteer (2020): Primary supervisor for conducting literature review of monitoring and evaluation indicators for focal WWF Coral Reef Rescue Initiative countries