


Caitlin D. Kuempel

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Education

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

- PhD Conservation Science
- Thesis title: Evaluating trade-offs between quantitative and qualitative protected area objectives
- Supervisors: Prof. Hugh Possingham, Prof. Catherine Lovelock and Dr. Alienor Chauvenet

Northeastern University, Nahant, MA Dec. 2013

- M.S. Marine Biology (emphasis in Coral Reef Ecology (GPA 4.0/4.0))
- Three Seas Program: 15 months of intensive course and field work in three unique environments

University of Iowa, Iowa City, IA May 2012

- B.S. Environmental Bioscience (with honors), B.A. French, Certificate in Sustainability
- Honors in coral morphometrics

Professional Experience

Post-doctoral Fellow, NCEAS, Santa Barbara, CA Sept. 2018-present

Quantifying, comparing and mapping the production and environmental impacts of all major food systems as part of the “Comparing the environmental impacts of global food systems” working group

Research Assistant, University of Queensland, St. Lucia, QLD, Australia June-Sept. 2018

Developed projects and performed analyses related to international seafood trade.

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.

Research Assistant, The University of Queensland, St. Lucia, QLD, Australia Sept. 2017-May 2018

Updated and built the online presence of the Centre for Biodiversity and Conservation Science

Research Assistant: University of Queensland, St. Lucia, QLD, Australia Jan.-March 2017

Contributed to stakeholder meetings and explored different scheduling scenarios for implementing land-sea spatial conservation plans in Papua New Guinea.

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
Produced thin-sections of coral specimens and performed morphometric analysis of the coral species *Diploria*, resulting in a final honors thesis and research presentation under the supervision of Dr. Ann Budd.

Grants and Awards

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

Great Barrier Reef Marine Park Authority Science for Management Award (\$1,000-declined) May 2017

Taylor and Francis University of Queensland Library Excellence Award in Research (\$1,000) May 2017

Australian Coral Reef Society Writing Retreat Scholarship (\$500) May 2016

Smithsonian Tropical Research Institute Short-Term Fellowship (\$2,000) June-Nov. 2013

University of Iowa Old Gold Scholarship (\$12,000) Aug. 2007-May 2011

University of Iowa Athletic Scholarship (Rowing) Jan. 2008-May 2011

Peer-Reviewed Publications

1. Kuempel, C.D., Froehlich, H.E., Halpern, B.S. (in revision). What the Neolithic Revolution can teach us about the future of seafood. *Nature Sustainability*
2. Davidson, L.N.K., Brown, C.J., Shumway, N., Holden, M., Jones, K. Klein, C., Kuempel, C.D., Stuart-Smith, R.D., McGowan, J., Possingham, H.P.P., Watson, J.E.M., Dulvy, N.K. (in revision). Gaps in threatened marine species protection inside and beyond MPAs. *Nature Sustainability*
3. Almaraz, M., Salter, A., Houlton, B.Z., Kuempel, C.D., Halpern, B.S. (in review). Substantial reductions of nitrogen loading in U.S. waters from modifications to protein consumption. *Nature Sustainability*
4. 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. (in press). Putting all food on the same table. *Proceedings of the National Academy of Sciences*
5. 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*

6. Daigle, R., Metaxas, A., Balbar, A., McGowan, J., Treml, E., Kuempel, C.D., Possingham, H., Beger, M. (in revision). Operationalizing ecological connectivity to identify spatial conservation priorities with Marxan Connect. *Methods in Ecology and Evolution*
7. 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*
8. 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*
9. 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*
10. 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*
11. 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*
12. 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*
13. 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*
14. Nelson, H.R., Kuempel, C.D., and Altieri, A.H. (2016). The resilience of reef invertebrate biodiversity to coral mortality. *Ecosphere*

Other Publications

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* <http://decision-point.com.au/article/achieving-the-targets-of-global-conventions/>

Presentations

* oral presentation, † invited presentation

Kuempel C† (2019) Conserving nature in a developing world. *NCEAS Roundtable*, Santa Barbara, CA, USA*

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† (2018) Evaluating trade-offs between quantitative and qualitative protected area objectives. *Centre for Biodiversity and Conservation Science Seminar*, University of Queensland*

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*

Kuempel C† (2016) Balancing area and effectiveness: Investigating trade-offs in the Convention on Biological Diversity Aichi Target 11. *Environmental Science Seminar*, University of Iowa*

Kuempel C, Chauvenet A, Possingham H (2016) Does rapid protected area expansion compromise ecological representation? *Student Conference on Conservation Science*, University of Cambridge, UK

Kuempel C and Altieri A (2014) The role of consumers in mediating coral-algal phase shifts. *43rd Annual Benthic Ecology Meeting*, Jacksonville, FL, USA*

Teaching Experience

CONS7021 Masters conservation decision-making course, University of Queensland June 2017, 2018

Lead exercises on the principles and basic use of Marxan spatial conservation planning software, including giving lectures, overseeing laboratory practicals and grading reports

Moreton Bay Research Station Science Camp, University of Queensland Oct. 2017-June 2018

Helped run two-day introductory course for primary school and international students to explore terrestrial and marine habitats and the flora and fauna of Stradbroke Island

BIOL3000 Third year conservation course, University of Queensland Aug. 2017

Facilitated learning exercises on the principles and basic use of Marxan spatial conservation planning software and helped grade reports

Spatial planning and decision-science workshop, Bogota, Colombia July 2017

Facilitated a workshop on decision science and practical exercises for using Marxan in spatial conservation planning

Stanford University Bing Overseas Program, University of Queensland Nov. 2017

Facilitated field exercises on seagrass, dugongs and coral reefs in Moreton Bay for Stanford exchange students and helped design individual research projects

R for beginners, WWF Indonesia Jakarta office Oct. 2016

Lead a two day course on the basics of programming in R for conservation practitioners

Spatial planning for marine protected area design, Bali, Indonesia Oct. 2016

Helped deliver training materials on using Marxan for spatial planning in Indonesia to government and NGO participants

MARS2005 Australia's Marine Environments second year course, University of Queensland May 2016

Led learning exercises centred around the unique ecosystems found on Stradbroke Island, Australia and helped students design, implement, analyse and report on group research projects

Service Roles

Academic Organizations

Reviewer for international publications including the Journal of Environmental Management, Biological Conservation, Marine Biology, PLoS One, and PeerJ.

Society for Conservation Biology University of Queensland/Brisbane Chapter

Member (2014-2018) Board Member/Treasurer (2015-2017)

Reef Life Survey

Survey Volunteer (2017)

PhD seminar series, The University of Queensland, St. Lucia, QLD, Australia

Organiser (2014-2015)

Queensland Catch a Rising Star Program, Queensland National Science Week

Participant (August 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

Working Groups

Post-doctoral Fellow Comparing the environmental impacts of global food systems, NCEAS, UC Santa Barbara Sept. 2018-Present

Participant Sustainable seafood and marine conservation, Heron Island, University of Queensland June 2019

Participant Incorporating connectivity into spatial conservation planning, The Nature Conservancy, Washington D.C. 2017

Participant/Coordinator Land-sea conservation planning in Papua New Guinea, Port Moresby, Papua New Guinea 2017

Participant/Coordinator Marine spatial planning in the Sunda Banda Seascape, Bali, Indonesia 2016

Organizer/Participant Global Marine Conservation. Lady Elliot Island, Australia 2016

Skills

Programming: = R (*advanced*), Matlab (*basic*) *Software:* = Marxan (*advanced*), Arc/QGIS, Adobe Illustrator, Microsoft Office