

Queensland Spatial Excellence Awards 2017

Citation

Postgraduate Student Award

Rebecca Runting

Climate change is expected to profoundly affect environmental, biological and social systems in the coming decades, but predicting how climate change will be manifested, and how exactly it will affect these systems is uncertain. Innovative approaches to planning are required to account for climate change impacts, while appropriately acknowledging uncertainty in climate change predictions. In Rebecca's thesis, she developed and evaluated spatially-explicit approaches to planning for coastal ecosystem services under uncertain rates of sea level rise in Moreton Bay, Queensland.

Rebecca's thesis addresses the important and topical issue of how to secure long-term conservation outcomes while accounting for uncertainty in climate change. If uncertainties are ignored, spatial conservation plans may ultimately fail to protect species and ecosystem services in the long-term, yet these risks are not typically accounted for in planning. Rebecca addressed this issue by developing a risk-sensitive, spatially-explicit approach to reserve selection that maximizes conservation objectives whilst hedging risk under climate change uncertainty and ensuring connectivity.

This formulation closely resembles the types of problems conservation planners typically face, whilst accounting for risk in a mathematically rigorous way. Rebecca applied this novel method to design a reserve system to preserve coastal wetlands and their ecosystem services that are threatened by uncertain rates of sea level rise.

Rebecca's thesis was well designed, comprehensive and innovative. Rebecca received positive feedback from the external examiners of her thesis, including:

"An excellent and comprehensive thesis, which was a pleasure to read"

"The candidate has demonstrated an excellent grasp of a diversity of disciplines and approaches including climate change science, ecosystem services and economics. The application of Modern Portfolio Theory was particularly novel."

"Rebecca's thesis is excellent—she covers an impressive breadth of scientific problems with clarity and scientific innovation"

Three sections of her PhD have already been published in international peer reviewed journals, and one is currently under review. These journals include Nature Communications, Global Change Biology, Conservation Letters, and Global Environmental Change (under review). Rebecca was also awarded the 2016 Society of Conservation Biology Oceania Best Student Paper Award for the Nature Communications paper, and the Best Poster Award (Second place) at the 8th Ecosystem Services Partnership World Conference in 2015 based on her work now published in Global Change Biology.

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Judges' Comments

“Rebecca has demonstrated excellent use of her knowledge and application of spatial and other sciences and we have therefore rated her highly in all categories”

“Climate change is a very relevant topic to all industries, not just the spatial industry and is shrouded by uncertainty and sensationalism. It is great to see a spatial application attempt to address part of such an important topic.”