
Ryan A. Chisholm

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EDUCATION

Princeton University, Princeton, New Jersey

- Ph.D., Ecology and Evolutionary Biology, Advisor: Simon Levin 2010
- M.A., Ecology and Evolutionary Biology 2007

University of Melbourne, Melbourne, Australia

- B.Sc., Mathematics and Statistics (Honors in Botany), Advisor: Mark Burgman 2001 (2004)
 - B.A., German 2001
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RESEARCH EXPERIENCE

Smithsonian Tropical Research Institute, Panama

- Post-doctoral researcher: “Tropical Forest Dynamics and Global Change” Aug 2010 - present

Princeton University, Princeton, New Jersey

- Graduate student: Ph.D. thesis “The ecological and economic impacts of alien invasive species with case studies from the South African Fynbos” Sep 2005 - present

University of Cape Town, Cape Town, South Africa

- Visiting researcher: Field and laboratory research for Ph.D. thesis Jul, Aug 2006 - 2009

Santa Fe Intitute, Santa Fe, New Mexico

- Participant in Complex Systems Summer School Jun 2007

University of Melbourne, Melbourne, Australia

- Ecologist: Population viability analysis, risk assessment Oct 2004 - Sep 2005
- Undergraduate student: Honors thesis “Neutral theory and Western Basalt Plains grasslands” Jul 2003 - May 2004

Parks and Wildlife Commission of the Northern Territory, Darwin, Australia

- Ecologist: Analysis of extinction risk patterns in Australian mammals May - Oct 2004
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OTHER EMPLOYMENT

Unico Computer Systems Pty Ltd., Melbourne, Australia

- Computer programmer: Software development for the Telstra telecommunications network Sep 2001 - Jul 2003

Toggetext Pty Ltd., Melbourne, Australia

- Computational linguist: Development of English-to-Indonesian machine-translation software (part time) Dec 2000 - Jul 2001

AWARDS, FELLOWSHIPS AND GRANTS

- Award for Outstanding Teaching by a Graduate Student, Department of Ecology and Evolutionary Biology, Princeton University 2009
- Africa Grand Challenge Research Grant, \$11,910 2008 - 2009
- David Gardner '69 Research Grant, \$14,000 2008 - 2009
- Princeton University Graduate Fellowship 2006 - 2009
- Robert May Fellowship, Princeton University 2005 - 2006
- Bruce Knox Honors Prize, University of Melbourne 2004

PUBLICATIONS*Peer reviewed*

- **Chisholm, R. A.** and B. A. Wintle. In press. Choosing ecosystem service investments that are robust to uncertainty in multiple parameters. *Ecological Applications*
- **Chisholm, R. A.** 2011. Time-dependent solutions of the spatially implicit neutral model of biodiversity. *Theoretical Population Biology* 80:71-79
- **Chisholm, R. A.** and H. C. Muller-Landau. 2011. A theoretical model linking interspecific variation in density dependence to species abundances. *Theoretical Ecology* 4:241-253
- **Chisholm, R. A.** and S. W. Pacala. 2011. Theory predicts a rapid transition from niche-structured to neutral biodiversity patterns across a speciation-rate gradient. *Theoretical Ecology* 4:195-200
- **Chisholm, R. A.** and S. W. Pacala. 2010. Niche and neutral models predict asymptotically equivalent species abundance distributions in high-diversity ecological communities. *Proceedings of the National Academy of Sciences* 107:15821-15825
- **Chisholm, R. A.** 2010. Tradeoffs between ecosystem services: water and carbon in a biodiversity hotspot. *Ecological Economics* 69:1973-1987
- **Chisholm, R. A.** and R. J. Taylor. 2010. Body size and extinction risk in Australian mammals: an information-theoretic approach. *Austral Ecology* 35:616-623
- **Chisholm, R. A.** and J. W. Lichstein. 2009. Linking dispersal, immigration and scale in the neutral theory of biodiversity. *Ecology Letters* 12:1385-1393
- **Chisholm, R. A.** 2009. The Ecology, Economics and Management of Alien Invasive Species. In S. A. Levin, editor. *The Princeton Guide to Ecology*. Princeton University Press, Princeton, NJ. pp. 731-739
- Bekessy, S. A., B. A. Wintle, A. Gordon, J. C. Fox, **R. Chisholm**, B. Brown, T. Regan, N. Mooney, S. M. Read, and M. A. Burgman. 2009. Modelling human impacts on the Tasmanian Wedge-tailed Eagle (*Aquila audax fleayi*). *Biological Conservation* 142:2438-2448
- **Chisholm, R. A.** and E. Filotas. 2009. Critical slowing down as an indicator of transitions in two-species models. *Journal of Theoretical Biology* 257:142-149
- Bekessy, S., B. Wintle, A. Gordon, **R. Chisholm**, L. Venier, and J. Pearce. 2008. Dynamic Landscape Meta-population Models and Sustainable Forest Management. In J. Millsaugh and F. Thompson, editors. *Models for Planning Wildlife Conservation in Large Landscapes*. Elsevier Science, The Netherlands. pp. 473-500

- **Chisholm, R. A.**, and R. J. Taylor. 2007. Null-hypothesis significance testing and the critical weight range for Australian mammals. *Conservation Biology* 21:1641-1645
- **Chisholm, R. A.** 2007. Sampling species abundance distributions: Resolving the veil-line debate. *Journal of Theoretical Biology* 247:600-607
- **Chisholm, R. A.**, and B. A. Wintle. 2007. Incorporating landscape stochasticity into population viability analysis. *Ecological Applications* 17:317-322
- Taylor, R. J., and **R. A. Chisholm**. 2005. The occurrence of hollows in eucalypts and Ironwood (*Erythrophleum chlorostachys*) in the Gulf region of the Northern Territory and its implications for timber harvesting. *Pacific Conservation Biology* 11:57-63
- Wintle, B. A., S. A. Bekessy, L. A. Venier, J. L. Pearce, and **R. A. Chisholm**. 2005. Utility of dynamic landscape metapopulation models for sustainable forest management. *Conservation Biology* 196:1930-1943
- **Chisholm, R. A.**, and M. A. Burgman. 2004. The unified neutral theory of biodiversity and biogeography: comment. *Ecology* 85:3172-3174

Other

- **Chisholm, R. A.** 2010. Exponential growth in invasion biology (book review). *Bioscience* 60:314-315
- **Chisholm, R. A.** and S. W. Pacala. 2011. Independent species in independent niches behave neutrally: Response. *Oikos* 120:964-965

PRESENTATIONS

Conference presentations

- **Chisholm, R. A.**, J. O'Dwyer, G. Ziv and H. C. Muller-Landau. Theoretical models of forest communities: Neutral theory plus. Ecological Society of America Annual Meeting. Austin TX. August 2011.
- Bewick, S. A., **R. A. Chisholm**, E. Akçay, W. Godsoe. 'Neutral' models with overlapping niches. Ecological Society of America Annual Meeting. Austin TX. August 2011.
- **Chisholm, R. A.**, H. C. Muller-Landau, et al. Relationships between biomass, productivity and diversity in forest tree communities. IUCN International Symposium on Climate Change and Forest Biodiversity Conservation. Beijing, China. July 2011.
- **Chisholm, R. A.** and H. C. Muller-Landau. A theoretical model linking interspecific variation in density dependence to species abundances. European Conference on Mathematical and Theoretical Biology. Krakow, Poland. July 2011.
- **Chisholm, R. A.** and S. W. Pacala. Asymptotic equivalence of niche and neutral theory. Ecological Society of America Annual Meeting. Pittsburgh PA. August 2010.
- **Chisholm, R. A.** Trade-offs between ecosystem services: water and carbon in a biodiversity hotspot. International Congress for Conservation Biology. Edmonton AB, Canada. July 2010.
- **Chisholm, R. A.** Trade-offs between ecosystem services: water and carbon in a biodiversity hotspot. World Congress of Environmental and Resource Economists. Montreal QC, Canada. June 2010.
- **Chisholm R. A.** Trade-offs between carbon, water and biodiversity: A case study from the Fynbos. Fynbos Forum. Oudtshoorn, South Africa. August 2008.
- **Chisholm, R. A.** and E. Filotas. Critical slowing down as a leading indicator of regime shift in the paradox of enrichment. New England Complex Systems Institute. Boston MA. October 2007.

- **Chisholm, R. A.** Conflicts between carbon sequestration and other ecosystem services: the Fynbos as a model system. Fynbos Forum. Langebaan, South Africa. August 2007.

Other seminars

- **Chisholm, R.A.** Parsimonious theoretical models of spatial and temporal biodiversity patterns in tropical forest tree communities. Department of Biological Sciences, National University of Singapore. Singapore. May 2011.
- **Chisholm, R. A.** Parsimonious theoretical models of spatial and temporal biodiversity patterns in tropical forest tree communities. Center for Tropical Forest Studies talk, Smithsonian Tropical Research Institute. Panama City, Panama. May 2011.
- **Chisholm, R. A.** Developing a parsimonious theoretical model to explain spatial and temporal patterns of diversity in a tropical forest tree community. Santa Fe Institute. Santa Fe NM. May 2011.
- **Chisholm, R. A.** Developing a parsimonious theoretical model to explain spatial and temporal patterns of diversity in a tropical forest tree community. Theoretical ecology group, Princeton University. Princeton NJ. April 2011.
- **Chisholm, R. A.** Developing a parsimonious theoretical model to explain spatial and temporal patterns of diversity in a tropical forest tree community. Organismic and Evolutionary Biology, Harvard University. Cambridge MA. April 2011.
- **Chisholm, R. A.** Body size and extinction risk in Australian mammals. Bambi Talk, Smithsonian Tropical Research Institute. Barro Colorado Island, Panama. April 2011.
- **Chisholm, R. A.** Theoretical models to explain correlations between negative density dependence and abundance in tropical forest tree seedlings. Center for Tropical Forest Studies talk, Smithsonian Tropical Research Institute. Panama City, Panama. March 2011.
- **Chisholm, R. A.** A theoretical model linking interspecific variation in density dependence to species abundances. Fellows Symposium, Smithsonian Tropical Research Institute. Panama City, Panama. March 2011.
- **Chisholm, R. A.** Theoretical models of forest communities: neutral theory plus. Center for Tropical Forest Studies Symposium, Smithsonian Tropical Research Institute. Panama City, Panama. February 2011.
- **Chisholm, R. A.** A theoretical model linking interspecific variation in density dependence to species abundances. Bambi talk, Smithsonian Tropical Research Institute. Barro Colorado Island, Panama. September 2010.
- **Chisholm, R. A.** Niche and neutral models predict asymptotically equivalent species abundance distributions in high-diversity ecological communities. Tupper talk, Smithsonian Tropical Research Institute. Panama City, Panama. August 2010.
- **Chisholm, R. A.** The ecology and economics of alien invasive species with a case study from the South African Fynbos. Department of Ecology and Evolutionary Biology, Princeton University. Princeton NJ. May 2010.
- **Chisholm, R. A.** Impacts of alien invasive trees on ecosystem services in a biodiversity hotspot. Gretchen Daily's lab group, Stanford University. Palo Alto CA. March 2010.
- **Chisholm, R. A.** Asymptotic equivalence of niche and neutral theory. Theoretical ecology group, Princeton University. Princeton NJ. March 2010.
- **Chisholm, R. A.** Linking dispersal, immigration and scale in the neutral theory of biodiversity. Center for Tropical Forest Sciences, Smithsonian Tropical Research Institute. Panama City, Panama. November 2009.

- **Chisholm, R. A.** Assigning biological meaning to the parameters of the neutral theory of biodiversity promotes rigorous confrontation with data. Theoretical ecology group, Princeton University. Princeton NJ. September 2009.
- **Chisholm, R. A.** Carbon sequestration and alien pine trees in the Fynbos. Lars Hedin's lab group, Princeton University. Princeton NJ. April 2009.
- **Chisholm, R. A.** Leading indicators of transitions in ecological systems. Theoretical ecology group, Princeton University. Princeton NJ. February 2009.
- **Chisholm, R. A.** The ecology and economics of invasive species with a case study from the South African Fynbos. Department of Ecology and Evolutionary Biology, Princeton University. Princeton NJ. February 2009.
- **Chisholm, R. A.** Trade-offs between ecosystem services: a case study of invasive pine trees in the South African Fynbos. David Wilcove's lab group, Princeton University. Princeton NJ. December 2008.
- **Chisholm, R. A.** A neutral theory of biological invasions. Theoretical ecology group, Princeton University. Princeton NJ. October 2008.
- **Chisholm, R. A.** Carbon sequestration and alien pine trees in the Fynbos. Plant Conservation Unit discussion group, University of Cape Town. Cape Town, South Africa. June 2008.
- **Chisholm, R. A.** Alien pine trees and carbon sequestration in the South African Fynbos. Lars Hedin's lab group, Princeton University. Princeton NJ. April 2008.
- **Chisholm, R. A.** A phylogenetic analysis of extinction risk in Australian mammals. Princeton-Penn-Rutgers Retreat, Princeton University. Princeton NJ. March 2008.
- **Chisholm, R. A.** A neutral framework for biological invasions. Theoretical ecology group, Princeton University. Princeton NJ. March 2008.
- **Chisholm, R. A.** Why are there no trees in the Fynbos? Theoretical ecology group, Princeton University. Princeton NJ. November 2007.
- **Chisholm, R. A.** Conflicts between carbon sequestration and other ecosystem services: the Fynbos as a model system. Climate change discussion group, University of Cape Town. Cape Town, South Africa. August 2007.
- **Chisholm, R. A.** Use and misuse of null-hypothesis significance testing. Complex Systems Summer School, Santa Fe Institute. Santa Fe, NM. June 2007.
- **Chisholm, R. A.** Conflicts between carbon sequestration and other ecosystem services: the Fynbos as a model system. Theoretical ecology group, Princeton University. Princeton NJ. May 2007.
- **Chisholm, R. A.** Null-hypothesis significance testing and the critical weight range for Australian mammals. Princeton-Penn-Rutgers Retreat, Rutgers University. New Brunswick NJ. March 2007.
- **Chisholm, R. A.** The economics of ecosystem services in the South African Fynbos. Department of Ecology and Evolutionary Biology, Princeton University. Princeton NJ. February 2007.

TEACHING EXPERIENCE

Princeton University, Princeton, New Jersey

- Guest lecturer: *Biology of Coral Reefs*, Prof. Stephen Pacala, Panama Spring 2011
- Guest lecturer: *The Science and Policy of Conserving Ecosystem Services*, Prof. David Wilcove Fall 2009
- Teaching assistant: *Statistics for Biology*, Prof. John Storey Fall 2009

- Teaching assistant: *Methods of Mathematical Ecology*, Prof. Simon Levin Spring 2009
- Teaching assistant: *Biology of Coral Reefs*, Prof. Stephen Pacala, Panama Spring 2008
- Teaching assistant: *Population and Community Ecology*, Prof. Andy Dobson Fall 2006
- Mentor: Supervised two Princeton undergraduate students as research assistants in South Africa Jul, Aug 2008 - 2009
- Statistics advisor: Held weekly office hours to assist Ecology and Evolutionary Biology seniors with thesis-related statistical analyses 2006 - 2009
- Writing tutor: Held monthly thesis-writing workshops for Ecology and Evolutionary Biology seniors 2005 - 2009

University of Melbourne, Melbourne, Australia

- Teaching assistant: *Mathematical Methods* 2003
- Teaching assistant: *Applied Mathematics* 2003

SERVICE

- Reviewer: *Proceedings of the National Academy of Sciences, American Naturalist, Ecology Letters, Ecology, Proceedings of the Royal Society B, PLoS ONE, Conservation Biology, Theoretical Population Biology, Ecological Economics, Landscape Ecology, Biotropica, Journal of Hydrology, Diversity, Journal of Theoretical Biology, New Phytologist, Theoretical Ecology, Oikos, Journal of Ecology, Diversity and Distributions, Journal of Applied Ecology*
- Graduate student government representative: Princeton University 2006 - 2008

TECHNICAL SKILLS

- Programming languages: C, C++, R, Perl, Basic, Prolog, ActionScript, x86 assembly language
- Software: MATLAB, Mathematica, LaTeX

LANGUAGES

- German (professional working proficiency)
- Spanish (limited working proficiency)
- Indonesian (limited working proficiency)
- Turkish (elementary proficiency)

REFERENCES

- Prof. Simon Levin: Department of Ecology and Evolutionary Biology, Princeton University
slevin@princeton.edu, (+1) 609 258 6880
- Prof. Stephen Pacala: Department of Ecology and Evolutionary Biology, Princeton University
pacala@princeton.edu, (+1) 609 258 6885
- Prof. John Storey: Department of Molecular Biology, Princeton University
jstorey@princeton.edu, (+1) 609 258 1331
- Prof. David Wilcove: Department of Ecology and Evolutionary Biology, Princeton University
dwilcove@princeton.edu, (+1) 609 258 7118
- Dr. Helene Muller-Landau: Smithsonian Tropical Research Institute, Panama
mullerh@si.edu, (+507) 212 8132
- Prof. Mark Burgman: Department of Botany, University of Melbourne
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