

ANDREW J. MACDONALD

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ACADEMIC APPOINTMENTS

- 2022-present Assistant Professor: Bren School of Environmental Science & Management, University of California, Santa Barbara
- 2018-2022 Assistant Researcher: Earth Research Institute, University of California, Santa Barbara
- 2016-2018 National Science Foundation Postdoctoral Research Fellow in Biology: Department of Biology, Stanford University
- 2016-2017 Center for International Security and Cooperation (CISAC) Science Postdoctoral Fellow: Stanford University

EDUCATION

- 2016 PhD, University of California, Santa Barbara
Department of Ecology, Evolution and Marine Biology
- 2010 MS, University of Michigan, Ann Arbor
School of Natural Resources and Environment, Ecology Concentration
- 2008 BA, University of Wisconsin, Madison
Majors: Political Science and Anthropology

PUBLICATIONS (*Student Coauthor/Mentee)

In review/revisions:

28. Hopkins, SR, IJ Jones, JC Buck, C Leboa, LH Kwong, K Jacobsen, C Rickards, AJ Lund, N Nova, **AJ MacDonald**, M Lambert-Peck, G De Leo & SH Sokolow. Environmental persistence of the world's most burdensome infectious and parasitic diseases. In revisions at *Frontiers in Public Health*.
27. **MacDonald, AJ**, S McComb & S Sambado. Linking Lyme disease ecology and epidemiology: reservoir host identity, not richness, determines tick infection and human disease in California. In revisions from *Ecology Letters*.
26. Kain, M, **AJ MacDonald**, EA Mordecai & L Mandle. Land-use planning for health: Tradeoffs and nonlinearities govern how land-use change impacts vector-borne disease risk. In revisions from *Ecological Applications*.
25. Hopkins, SR, KD Lafferty, CL Wood, SH Olson, JC Buck, M Childs, GA de Leo, KJ Fiorella, J Fornberg, A Garchitorena, ME Howard, IJ Jones, AM Kuris, LH Kwong, C LeBoa, AE Leon, AJ Lund, **AJ MacDonald**, DCG Metz, N Nova, AJ Peel, JV Remais, TE Stewart Merrill, M Wilson, MH Bonds, AP Dobson, D Lopez Carr, L Mandle & SH Sokolow. Evidence synthesis proposes 47 win-win solutions for conservation and human infectious disease. In revisions at *Lancet Planetary Health*.
24. Sokolow, S, IJ Jones, CL Wood, KD Lafferty, A Garchitorena, S Hopkins, M Boslough, L Marom, A Lund, **AJ MacDonald**, M Howard, N Nova, C Le Boa, A Peel, E Mordecai, A Chamberlin, M Barry, M Bonds & GA De Leo. More than one third of global human infectious disease burden is environmentally mediated, with disproportionate effects in rural poor areas. In revisions at *Lancet Planetary Health*.

Published

23. *Boser, A, D Sousa, AE Larsen & **AJ MacDonald**, 2021. Micro-climate to macro-risk: Mapping fine scale differences in mosquito-borne disease risk using remote sensing. *Environmental Research Letters*, 16:124014.
22. **MacDonald, AJ** & EA Mordecai, 2021. Response to Valle and Zorello Laporta: Clarifying the use of instrumental variable methods to understand the effects of environmental change on infectious disease transmission. *American Journal of Tropical Medicine and Hygiene*, 105(6):1456-1459.
21. Athni, TS, MS Shocket, L Couper, N Nova, IR Caldwell, JM Caldwell, JN Childress, ML Childs, GA De Leo, D Kirk, **AJ MacDonald**, K Olivarius, DG Pickel, S Roberts, OC Winokur, HS Young, J Cheng, EA Grant, PM Kurzner, S Kyaw, BJ Lin, RC Lopez, DS Massihpour, EC Olsen, M Roache, A Ruiz, EA Schultz, M Shafat, RL Spencer, N Bharti & EA Mordecai, 2021. The influence of vector-borne disease on human history: socio-ecological mechanisms. *Ecology Letters*, 24(4):829-846.
20. Nova, N, ER Deyle, MS Shocket, **AJ MacDonald**, ML Childs, M Rypdal, G Sugihara and EA Mordecai, 2021. Susceptible host availability modulates climate effects on dengue dynamics. *Ecology Letters*, 24(3):415-425.
19. *Couper, LI, **AJ MacDonald** & EA Mordecai, 2021. Impact of prior and projected climate change on US Lyme disease incidence. *Global Change Biology*, 27(4):738-754.
18. Hopkins, SR, SH Sokolow, GA De Leo, JC Buck, IJ Jones, L Kwong, C LeBoa, AJ Lund, **AJ MacDonald**, N Nova, SH Olson, AJ Peel, CL Wood & KD Lafferty, 2021. How to identify win—win interventions that benefit human health and conservation. *Nature Sustainability*, 4:298-304.
17. Jones, IJ, **AJ MacDonald**, S Hopkins, A Lund, Z Yung-Chun Liu, NI Fawzi, MP Purba, K Fankhauser, M Nirmala, AG Blundell, A Emerson, J Jennings, L Gaffikin, M Barry, D Lopez-Carr, K Webb, GA De Leo & SH Sokolow, 2020. Improving rural health care reduces illegal logging and conserves carbon in a tropical forest. *Proceedings of the National Academy of Sciences*, 117(45):28515-28524.
16. **MacDonald, AJ**, S McComb, C O’Neill, KA Padgett & AE Larsen, 2020. Projected climate and land use change alter arthropod vector phenology, seasonal host-seeking suitability and human encounter risk. *Global Change Biology*, 26:5459-5474.
15. Small, C, **AJ MacDonald** & D Sousa. Spatial network connectivity of population and development in the USA: Implications for disease transmission. *arXiv*, arXiv:2004.14237. **Pre-print published online, April 2020, for rapid dissemination of data pertinent to epidemiologic modeling of COVID-19 in the USA (supported by NSF EAGER #2032276).
14. **MacDonald, AJ**, SB Weinstein, KE O’Connor & A Swei, 2020. Circulation of tick-borne spirochetes in tick and small mammal communities in Santa Barbara County, California, USA. *Journal of Medical Entomology*, 57(4):1293-1300.
13. Larsen, AE, *DN Farrant & **AJ MacDonald**, 2020. Spatiotemporal overlap of pesticide use and species richness hotspots in California. *Agriculture, Ecosystems and Environment*, 289:106741.
12. Vandermeer, J, I Armbrrecht, A de la Mora, KK Ennis, DJ Gonthier, Z Hajian-Forooshani, H-Y Hsieh, A Iverson, D Jackson, S Jha, E Jiménez-Soto, G Lopez-Bautista, A Larsen, K Li, H Liere, **AJ MacDonald**, L Marin, KA Mathis, I Monagan, J Morris, T Ong, GL Pardee, IS Rivera, K Williams-Guillen, S Yitbarek, S Uno, A Zemenick, SM Philpott and I Perfecto, 2019. The community ecology of herbivore regulation in an agroecosystem: Lessons from complex systems. *BioScience*, 69(12):974-996.

11. **MacDonald, AJ** & EA Mordecai, 2019. Amazon deforestation drives malaria transmission, and malaria burden reduces forest clearing. *Proceedings of the National Academy of Sciences*, 116(44): 22212-22218.
10. **MacDonald, AJ**, C O'Neill, MH Yoshimizu, KA Padgett & AE Larsen, 2019. Tracking seasonal activity of the western blacklegged tick across California. *Journal of Applied Ecology*, 56:2562-2573.
9. **MacDonald, AJ**, AE Larsen, & AJ Plantinga, 2019. Missing the people for the trees: Identifying coupled natural-human system feedbacks driving the ecology of Lyme disease. *Journal of Applied Ecology*, 56:354-364.
8. **MacDonald, AJ**, 2018. Abiotic and habitat drivers of tick vector abundance, diversity, phenology and human encounter risk in southern California. *PLOS One*, 13(7):e02001665.
7. Anderson, S, R Bart, M Kennedy, **AJ MacDonald**, M Moritz, AJ Plantinga, C Tague & M Wibbenmeyer, 2018. The dangers of disaster-driven responses to climate change. *Nature Climate Change*, 8:651-653.
6. **MacDonald, AJ**, *DW Hyon, *A McDaniels, KE O'Connor, A Swei, & CJ Briggs, 2018. Risk of vector tick exposure initially increases then declines through time in response to wildfire in California. *Ecosphere*, 9(5):e02227.
5. **MacDonald, AJ**, *DW Hyon, *JB Brewington III, KE O'Connor, A Swei, & CJ Briggs, 2017. Lyme disease risk in southern California: abiotic and environmental drivers of *Ixodes pacificus* (Acari: Ixodidae) density and infection prevalence with *Borrelia burgdorferi*. *Parasites & Vectors*, 10:7.
4. **MacDonald, AJ**, & CJ Briggs, 2016. Truncated seasonal activity patterns of the western blacklegged tick (*Ixodes pacificus*) in central and southern California. *Ticks and Tick-Borne Diseases*, 7: 234-242.
3. Larsen, AE, *BT Hendrickson, *N Dedeic, & **AJ MacDonald**, 2015. Taken as a given: Evaluating the accuracy of remotely sensed crop data. *Agricultural Systems*, 141: 121-125.
2. Larsen, AE, **AJ MacDonald**, & AJ Plantinga, 2014. Lyme disease risk influences human settlement in the wildland-urban interface: Evidence from a longitudinal analysis of counties in the northeastern United States. *American Journal of Tropical Medicine and Hygiene*, 91(4): 747-755.
1. **MacDonald, AJ**, D Jackson, & *K Zemenick, 2013. Indirect effects of a fungal entomopathogen, *Lecanicillium lecanii* (Hypocreales: Clavicipitaceae), on a coffee agroecosystem ant community. *Environmental Entomology*, 42(4): 658-667.

Book Chapters

1. Shocket, MS, CB Anderson, JM Caldwell, ML Childs, LI Couper, S Han, M Harris, ME Howard, MP Kain, **AJ MacDonald**, N Nova & EA Mordecai, 2021. Environmental drivers of vector-borne disease. In *Population biology of vector-borne diseases*, Oxford University Press.

GRANTS IN SUPPORT OF RESEARCH

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| 2021-2022 | Centers for Disease Control and Prevention, Pacific Southwest Center of Excellence in Vector-Borne Diseases Training Grant – Co-PI; awarded to support PhD student mentee Samantha Sambado (\$25,000) |
| 2020-2022 | NSF EAGER: “Rapid Production of Geospatial Network Inputs for Spatially Explicit Epidemiologic Modeling of COVID-19 in the USA” – Co-PI (\$198,638; #2032276) |

2020-2025	NSF Ecology and Evolution of Infectious Diseases: “How land use change transforms the landscape of vector-borne disease” – Co-PI (\$2,000,000; #2011147)
2018-2019	UC Santa Barbara Faculty Research Grant: “Spatial and temporal variation in human disease risk in California, now and under future environmental change” – Co-PI (\$10,000)
2017-2018	Stanford Volpert Scholars Award in Earth Science; awarded to undergraduate mentee Songhee Han (\$7,000)
2016-2018	NSF Postdoctoral Research Fellowship in Biology (\$30,000 Research Allowance)
2014-2015	University of California Natural Reserve System Mildred E. Mathias Graduate Student Research Grant (\$2,850)
2013-2014	University of California Natural Reserve System Mildred E. Mathias Graduate Student Research Grant (\$2,614)
2013	Undergraduate Research and Creative Activities Grant; to undergraduate mentee Narek Ohanian (\$750)
2012-2013	Scifund Challenge Research Fundraising (\$3,000)
2009	School of Natural Resources & Environment Thesis Research Grant (UM): Summer 2009 (\$1,000)
2009	Rackham Graduate Student Research Grant (UM): Summer 2009 (\$1,500)

FELLOWSHIPS AND AWARDS

2016	Stanford University Center for International Security and Cooperation Science Postdoctoral Fellowship
2016	National Science Foundation Postdoctoral Research Fellowship in Biology (Stanford University) (\$138,000; #1611767)
2016	Harvard University Rockefeller Foundation Planetary Health Postdoctoral Fellowship (Declined) (\$120,000)
2016	National Socio-Environmental Synthesis Center (SESYNC) Postdoctoral Fellowship Program Finalist (Declined final interview)
2016	UC Natural Reserve System Institute for the Study of Ecological and Evolutionary Climate Impacts (ISEECI) Fellowship: Winter 2016 (\$11,000)
Pre-2016	UCSB Affiliates Fellowship: Fall 2015 (\$3,000); Worster Award for Graduate/Undergraduate Collaborative Research: Summer 2013 (\$3,290) and Summer 2015 (\$2,742); Department of Ecology Evolution and Marine Biology Block Grant: Winter 2014 (\$11,000) and winter 2015 (\$11,000); Graduate Students Association Conference Travel Grant: Summer 2013 (\$100); California Weed Science Society scholarship (\$1,000); Bren School Conference Travel Grant: Summer 2011 (\$500); Michael J. Connell Memorial Fund Fellowship (\$11,000); School of Natural Resources & Environment Conference Travel Grant (UM): Summer 2010 (\$600); Samuel A. Graham Award in Forest Biology (UM): Winter 2010 (\$500); Rackham Conference Travel Grant (UM): Fall 2009 (\$600)

INVITED SEMINARS AND LECTURES

17. Cornell University, Department of Entomology and Department of Public and Ecosystem Health Invited Seminar (remote). *12/20/2021*
16. Bren School UCSB, Invited Seminar. Santa Barbara, CA; *12/2/2021*
15. University of Wisconsin, Department of Entomology Invited Seminar. Madison, WI; *11/15/2021*
14. Montana State University, Department of Land Resources and Environmental Sciences Invited Seminar. Bozeman, MT; *11/2/2021*.

13. UCSB Natural Reserve System Seminar Series, Coal Oil Point Reserve Invited Seminar. Santa Barbara, CA; 11/5/2020
12. Stanford University, Natural Capital Symposium 2020, Plenary Boething Lecture: Nature and Health. Stanford, CA; 3/16-3/18/2020 (*postponed due to COVID-19)
11. University of Wisconsin, Department of Entomology Invited Seminar. Madison, WI; 10/25/2019
10. UCSB La Kretz Center Research Symposium, Sedgwick Reserve. Santa Ynez Valley, CA; 9/28/2019
9. UCSB Sedgwick Reserve Walking Ecology Lecture Series. Santa Ynez Valley, CA; 5/11/2019
8. National Socio-Environmental Synthesis Center (SESYNC), Boundary Spanning Symposium. Annapolis, MD; 6/12/2018
7. UC Berkeley Hastings Reserve Invited Seminar. Carmel Valley, CA; 5/31/2018
6. San Francisco State University, Department of Biology Seminar Speaker. San Francisco, CA; 4/24/2018
5. Bren School UCSB, Invited Seminar. Santa Barbara, CA; 5/11/2017
4. University of California Institute for the Study of Ecological and Evolutionary Climate Impacts Research Symposium. Sedgwick Reserve, Santa Ynez Valley, CA; 5/6/2017
3. Virginia Tech, Department of Entomology Invited Seminar. Blacksburg, VA; 4/10/2017
2. Stanford Center for International Security and Cooperation Science Seminar Series Invited Speaker. Stanford, CA; 1/23/2017
1. UCSB Sedgwick Reserve Walking Ecology Lecture Series. Santa Ynez Valley, CA; 1/24/2014

WORKING GROUPS

California Tick-Borne Disease Working Group: In collaboration with California Department of Public Health and UC Davis Veterinary Medicine; identify research and outreach priorities for tick-borne disease in California (2016 – UC Davis, 2018 – UC Davis, 2019 – CDPH Richmond Office, 2021 – Virtual, 2022 – Virtual).

NCEAS/SNAPP Working Group: National Center for Ecological Analysis and Synthesis, Science for Nature and People Partnership: “Ecological levers for health.”

NCEAS Working Group: National Center for Ecological Analysis and Synthesis: “What makes reintroductions work? Developing a comprehensive framework to evaluate and guide reintroduction efforts.”

TEACHING

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| 2022 | Instructor of Record: Bren School, UCSB: Biological Community Survey and Analysis (Anticipated Spring 2022) |
| 2021 | Instructor of Record: Environmental Studies Department, UCSB: Planetary health: linkages between health and environment in an age of rapid environmental change (Spring 2021) |
| 2019 | Guest Instructor: Biological Community Survey and Analysis (Bren School, UCSB); guest instructor for field methods for working with small mammals and surveying arthropod communities (Spring 2019) |
| 2010-2016 | Teaching Assistant, UCSB: Invertebrate Zoology (Spring 2012, 2013, 2014, 2015, 2016); Intro to Ecology (Fall 2013); Ecology of Disease (Winter 2012, 2013, Summer 2012); Conservation Ecology (Fall 2012); Intro to Environmental Studies (Fall 2011); Biological Community Survey and Analysis (Bren School graduate course, Spring 2011); Ecology of Managed Systems (Bren School graduate course, Fall 2010); Graduate Student Association, Excellence in Teaching Award (Nominated 2013, 2014) |

- 2014-2016 Guest Instructor: Santa Barbara City College Field Methods in Ecology Course (Winter/Spring 2014, 2015, 2016); working with small mammals in the field
- 2009-2010 Guest Lecturer: Ecological Issues, University of Michigan (Fall 2009, Winter 2010)
- 2009-2010 Graduate Student Instructor, University of Michigan: Ecological Issues (Fall 2009, Winter 2010)

MENTORSHIP

- Graduate
- PhD student Samantha Sambado (Ecology, Evolution and Marine Biology, UCSB) – co-chair of committee, 2019-present
- PhD student Kacie Ring (Ecology, Evolution and Marine Biology, UCSB) – member of committee, 2020-present
- PhD student Lisa Couper (Biology, Stanford University) – member of committee, 2019-present
- 4 Bren MESM Students: Craig O’Neill (2018), Sofie McComb (2019-2020), Meghan Bowen (2019), Mauricio Collado (2021)
- Undergraduate
- 23 UCSB undergraduates (2 current) in Ecology, Evolution and Marine Biology, Environmental Studies, Statistics and Data Science, and Molecular, Cell and Developmental Biology; 2 Stanford undergraduates in Biology and Earth Science; 1 University of Michigan undergraduate in Ecology and Evolutionary Biology (published peer reviewed research articles with 6 undergraduates)
- High School
- 4 high school students (2 students as part of UCSB Research Mentorship Program, 2 students as part of Stanford RISE Program)

DIVERSITY, EQUITY AND INCLUSION

- UCSB McNair Scholars Program Faculty Advisor:
Current faculty advisor for UCSB McNair Scholar, Abraham Soto.
- Stanford Raising Interest in Science and Engineering (RISE) Summer Program:
Mentor for the RISE Program, which provides funded internship opportunities for underrepresented high school students to participate in scientific research at Stanford (Summer 2017).
- UCSB McNair Scholars Program Graduate Student Mentor:
Graduate student mentor for UCSB STEM undergraduate students in the McNair Scholars Program (2014-2016).
- UCSB Research Mentorship Program:
Mentor to two underrepresented high school students in summer research internships (Summer 2013).

SERVICE AND PROFESSIONAL ACTIVITIES

- Scientific Peer Review (~5-10 articles per year): *Nature Sustainability, Science of the Total Environment, Trends in Parasitology, PLOS Neglected Tropical Diseases, EcoHealth, Journal of Animal Ecology, Journal of Vector Ecology, PLOS One, Remote Sensing, Journal of Medical Entomology, Parasites and Vectors, Experimental and Applied Acarology, Agricultural and Forest Entomology*

- Scientific Conference Presentations:

Ecological Society of America Annual Meeting: 2010-2013, 2015, 2017, 2019, 2020
Ecology and Evolution of Infectious Disease Annual Meeting: 2015, 2017, 2019
Entomological Society of America Annual Meeting: 2009
World Congress of the International Association for Landscape Ecology: 2019
Planetary Health Alliance Annual Meeting: 2019
Stanford Center for Innovation in Global Health Research Convening: 2020

Committees: UC Natural Reserve System Advisory Committee (2014-2016)

Research Outreach and Science Communication:

Co-organizer, Natural Capital Project Symposium special session on land use change and vector-borne disease in Latin America, March 19, 2019, Stanford University

Science communication through news and other media outlets, including: [National Geographic](#), [The BBC](#), [Last Week Tonight with John Oliver](#), [Now This News](#), [The Poetry of Science Blog](#), among others

Society Memberships: Ecological Society of America, Entomological Society of America, International Association for Landscape Ecology, American Society of Tropical Medicine and Hygiene

OTHER EXPERIENCE AND EDUCATION

2016	Google Earth Engine User Summit, Mountain View, CA: 6/14/16-6/16/16
2014	Software Carpentry Bootcamp, Bren School, UCSB: 1/31/14-2/1/14
2011	Ecology and Evolution of Infectious Disease Workshop, UCSB, Santa Barbara, CA – 6/18/11 – 6/25/11
2010-2013	COMPASS Science Communication Workshops: “Communicating effectively and making your science matter,” Bren School of Environmental Science and Management, UCSB 10/1/10; “Communicating science in a policy context,” Bren School of Environmental Science and Management, UCSB 11/19/10; “The Power of Story: Science Communication Workshop,” EEMB, 2/1/13
2009	Celas Maya Spanish Language School, Xela, Guatemala: Intensive Spanish Language Immersion Program - May, 2009
2007	City University, London, UK: International Politics and Development Concentration - September-December, 2007