

## 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. **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 *Nature Communications*.
27. 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*.
26. 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*.
25. 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*

24. 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. Accepted at *Frontiers in Public Health*.

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 Sweig, 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**

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**

18. University of California, Riverside, Department of Entomology Invited Seminar. 5/9/2022
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

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