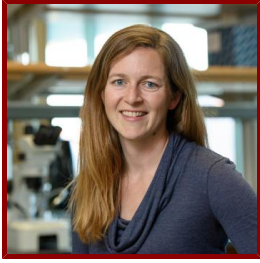


Stanford



Erin Mordecai

Assistant Professor of Biology and Center Fellow, by courtesy, at the Woods Institute for the Environment

 NIH Biosketch available Online

Bio

BIO

My research focuses on the ecology of infectious disease. I am interested in how climate, species interactions, and global change drive infectious disease dynamics in humans and natural ecosystems. This research combines mathematical modeling and empirical work.

I finished my PhD in 2012 at the University of California Santa Barbara in Ecology, Evolution, and Marine Biology. I then completed a 2-year NSF postdoctoral research fellowship in the Intersection of Biology and Mathematical and Physical Sciences and Engineering at the University of North Carolina at Chapel Hill and North Carolina State University. I have been at Stanford since January 2015.

ACADEMIC APPOINTMENTS

- Assistant Professor, Biology
- Center Fellow (By courtesy), Stanford Woods Institute for the Environment
- Member, Bio-X

HONORS AND AWARDS

- Leading Interdisciplinary Collaborations Fellow, Woods Institute for the Environment, Stanford University (2018-2019)
- Early Career Fellow, Ecological Society of America (2019)
- Walter J. Gores Award for Teaching, Stanford University (2019)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Affiliate, Woods Institute for the Environment (2018 - present)
- Editorial Advisory Board Member, Lancet Planetary Health (2019 - present)
- Member, Jasper Ridge Faculty Advisory Committee (2015 - present)
- Associate Editor, Ecology Letters (2019 - present)
- Faculty Fellow, Center for Innovation in Global Health (2015 - present)
- Faculty Fellow, King Center on Global Development (2019 - present)

PROFESSIONAL EDUCATION

- B.S., University of Georgia , Honors Interdisciplinary Studies in Mathematical Biology (2007)
- PhD, University of California Santa Barbara , Ecology, Evolution, and Marine Biology (2012)

LINKS

- My Lab Website: <http://www.mordecailab.com/#about-marquee>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Our research focuses on the ecology of infectious disease. We are interested in how climate, species interactions, and global change drive infectious disease dynamics in humans and natural ecosystems. This research combines mathematical modeling and empirical work. Our main study systems include vector-borne diseases in humans and fungal pathogens in California grasses.

Teaching

COURSES

2018-19

- Ecology and Evolution of Infectious Disease in a Changing World: BIO 2N (Spr)
- Introduction to Ecology: BIO 81 (Aut)

2017-18

- Introduction to Ecology: BIO 81 (Aut)

2016-17

- Ecology: BIO 101 (Aut)
- Ecology and Evolution of Infectious Disease in a Changing World: BIO 2N (Spr)

STANFORD ADVISEES

Richard Grewelle

Doctoral Dissertation Reader (AC)

Glade Dlott, Emily Ebel, J. Nicholas Hendershot, Isabel Jones, Jessica Martin, Jeffrey Smith

Postdoctoral Faculty Sponsor

Morgan Kain, Devin Kirk

Doctoral Dissertation Advisor (AC)

Lisa Couper, Nicole Nova

Doctoral (Program)

Marissa Childs, Nicole Nova

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biology (School of Humanities and Sciences) (Phd Program)
- Epidemiology (Phd Program)

Publications

PUBLICATIONS

- **An open challenge to advance probabilistic forecasting for dengue epidemics (vol 116, pg 24268, 2019)** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*

- Johansson, M. A., Apfeldorf, K. M., Dobson, S., Devita, J., Buczak, A. L., Baugher, B., Moniz, L. J., Bagley, T., Babin, S. M., Guven, E., Yamana, T. K., Shaman, J., Moschou, et al
2019; 116 (51): 26087–88
- **Towards common ground in the biodiversity-disease debate.** *Nature ecology & evolution*
Rohr, J. R., Civitello, D. J., Halliday, F. W., Hudson, P. J., Lafferty, K. D., Wood, C. L., Mordecai, E. A.
2019
 - **An open challenge to advance probabilistic forecasting for dengue epidemics.** *Proceedings of the National Academy of Sciences of the United States of America*
Johansson, M. A., Apfeldorf, K. M., Dobson, S., Devita, J., Buczak, A. L., Baugher, B., Moniz, L. J., Bagley, T., Babin, S. M., Guven, E., Yamana, T. K., Shaman, J., Moschou, et al
2019
 - **Amazon deforestation drives malaria transmission, and malaria burden reduces forest clearing.** *Proceedings of the National Academy of Sciences of the United States of America*
MacDonald, A. J., Mordecai, E. A.
2019
 - **Mosquito and primate ecology predict human risk of yellow fever virus spillover in Brazil.** *Philosophical transactions of the Royal Society of London. Series B, Biological sciences*
Childs, M. L., Nova, N., Colvin, J., Mordecai, E. A.
2019; 374 (1782): 20180335
 - **Dynamic and integrative approaches to understanding pathogen spillover.** *Philosophical transactions of the Royal Society of London. Series B, Biological sciences*
Becker, D. J., Washburne, A. D., Faust, C. L., Pulliam, J. R., Mordecai, E. A., Lloyd-Smith, J. O., Plowright, R. K.
2019; 374 (1782): 20190014
 - **The problem of scale in the prediction and management of pathogen spillover.** *Philosophical transactions of the Royal Society of London. Series B, Biological sciences*
Becker, D. J., Washburne, A. D., Faust, C. L., Mordecai, E. A., Plowright, R. K.
2019; 374 (1782): 20190224
 - **Thermal biology of mosquito-borne disease.** *Ecology letters*
Mordecai, E. A., Caldwell, J. M., Grossman, M. K., Lippi, C. A., Johnson, L. R., Neira, M., Rohr, J. R., Ryan, S. J., Savage, V., Shocket, M. S., Sippy, R., Stewart Ibarra, A. M., Thomas, et al
2019
 - **A global test of ecoregions (vol 2, pg 1889, 2018) NATURE ECOLOGY & EVOLUTION**
Smith, J. R., Letten, A. D., Ke, P., Anderson, C. B., Hendershot, J., Dhami, M. K., Dlott, G. A., Grainger, T. N., Howard, M. E., Morrison, B. L., Routh, D., San Juan, P. A., Mooney, et al
2019; 3 (4): 708
 - **Author Correction: A global test of ecoregions.** *Nature ecology & evolution*
Smith, J. R., Letten, A. D., Ke, P., Anderson, C. B., Hendershot, J. N., Dhami, M. K., Dlott, G. A., Grainger, T. N., Howard, M. E., Morrison, B. M., Routh, D., Juan, P. A., Mooney, et al
2019
 - **Global expansion and redistribution of Aedes-borne virus transmission risk with climate change** *PLOS NEGLECTED TROPICAL DISEASES*
Ryan, S. J., Carlson, C. J., Mordecai, E. A., Johnson, L. R.
2019; 13 (3)
 - **Priority Effects and Nonhierarchical Competition Shape Species Composition in a Complex Grassland Community** *AMERICAN NATURALIST*
Uricchio, L. H., Daws, S., Spear, E. R., Mordecai, E. A.
2019; 193 (2): 213–26
 - **Malaria smear positivity among Kenyan children peaks at intermediate temperatures as predicted by ecological models.** *Parasites & vectors*
Shah, M. M., Krystosik, A. R., Ndenga, B. A., Mutuku, F. M., Caldwell, J. M., Otuka, V., Chebii, P. K., Maina, P. W., Jembe, Z., Ronga, C., Bisanzio, D., Anyamba, A., Damoah, et al
2019; 12 (1): 288

- **Climate drives spatial variation in Zika epidemics in Latin America.** *Proceedings. Biological sciences*
Harris, M., Caldwell, J. M., Mordecai, E. A.
2019; 286 (1909): 20191578
- **Global expansion and redistribution of Aedes-borne virus transmission risk with climate change.** *PLoS neglected tropical diseases*
Ryan, S. J., Carlson, C. J., Mordecai, E. A., Johnson, L. R.
2019; 13 (3): e0007213
- **A global test of ecoregions** *NATURE ECOLOGY & EVOLUTION*
Smith, J. R., Letten, A. D., Ke, P., Anderson, C. B., Hendershot, J., Dhami, M. K., Dlott, G. A., Grainger, T. N., Howard, M. E., Morrison, B. L., Routh, D., San Juan, P. A., Mooney, et al
2018; 2 (12): 1889–96
- **A global test of ecoregions.** *Nature ecology & evolution*
Smith, J. R., Letten, A. D., Ke, P., Anderson, C. B., Hendershot, J. N., Dhami, M. K., Dlott, G. A., Grainger, T. N., Howard, M. E., Morrison, B. M., Routh, D., San Juan, P. A., Mooney, et al
2018
- **Foliar pathogens are unlikely to stabilize coexistence of competing species in a California grassland** *ECOLOGY*
Spear, E. R., Mordecai, E. A.
2018; 99 (10): 2250–59
- **Foliar pathogens are unlikely to stabilize coexistence of competing species in a California grassland.** *Ecology*
Spear, E. R., Mordecai, E. A.
2018
- **Temperature explains broad patterns of Ross River virus transmission.** *eLife*
Shocket, M. S., Ryan, S. J., Mordecai, E. A.
2018; 7
- **Temperature explains broad patterns of Ross River virus transmission** *ELIFE*
Shocket, M., Ryan, S. J., Mordecai, E. A.
2018; 7
- **Temperature drives Zika virus transmission: evidence from empirical and mathematical models** *PROCEEDINGS OF THE ROYAL SOCIETY B-BIOLOGICAL SCIENCES*
Tesla, B., Demakovskiy, L. R., Mordecai, E. A., Ryan, S. J., Bonds, M. H., Ngonghala, C. N., Brindley, M. A., Murdock, C. C.
2018; 285 (2884)
- **Estimating the effects of variation in viremia on mosquito susceptibility, infectiousness, and R-0 of Zika in Aedes aegypti** *PLOS NEGLECTED TROPICAL DISEASES*
Tesla, B., Demakovskiy, L. R., Packiam, H. S., Mordecai, E. A., Rodriguez, A. D., Bonds, M. H., Brindley, M. A., Murdock, C. C.
2018; 12 (8): e0006733
- **Seasonal temperature variation influences climate suitability for dengue, chikungunya, and Zika transmission** *PLOS NEGLECTED TROPICAL DISEASES*
Huber, J. H., Childs, M. L., Caldwell, J. M., Mordecai, E. A.
2018; 12 (5): e0006451
- **PHENOMENOLOGICAL FORECASTING OF DISEASE INCIDENCE USING HETEROSKEDASTIC GAUSSIAN PROCESSES: A DENGUE CASE STUDY** *ANNALS OF APPLIED STATISTICS*
Johnson, L. R., Gramacy, R. B., Cohen, J., Mordecai, E., Murdock, C., Rohr, J., Ryan, S. J., Stewart-Ibarra, A. M., Weikel, D.
2018; 12 (1): 27–66
- **BUILDING ECOLOGY INTO MODELS TO PREDICT ARBOVIRUS DYNAMICS**
Caldwell, J., Mutuku, F., Ndenga, B., Mordecai, E., LaBeaud, D.
AMER SOC TROP MED & HYGIENE.2018: 63
- **IMPACTS OF TEMPERATURE ON ZIKA VIRUS TRANSMISSION POTENTIAL**
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AMER SOC TROP MED & HYGIENE.2018: 502

- **TEMPERATURE DRIVES ZIKA VIRUS TRANSMISSION: EVIDENCE FROM EMPIRICAL AND MATHEMATICAL MODELS**
Tesla, B., Demakovsky, L., Mordecai, E., Ryan, S., Bonds, M., Ngonghala, C., Brindley, M., Murdock, C.
AMER SOC TROP MED & HYGIENE.2018: 23
- **EFFECTS OF TEMPERATURE ON ZIKA, DENGUE AND CHIKUNGUNYA TRANSMISSION BY AEDES AEGYPTI AND AE-ALBOPICTUS**
Mordecai, E., Cohen, J., Evans, M., Johnson, L. R., Gudapati, P., Miazgowicz, K., Murdock, C. C., Rohr, J., Ryan, S. J., Savage, V., Ibarra, A., Thomas, M. B., Shocket, et al
AMER SOC TROP MED & HYGIENE.2017: 433–34
- **Disease ecology, health and the environment: a framework to account for ecological and socio-economic drivers in the control of neglected tropical diseases** *PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B-BIOLOGICAL SCIENCES*
Garchitorena, A., Sokolow, S. H., Roche, B., Ngonghala, C. N., Jocke, M., Lund, A., Barry, M., MORDECAI, E. A., Daily, G. C., Jones, J. H., Andrews, J. R., Bendavid, E., Luby, et al
2017; 372 (1722)
- **Detecting the impact of temperature on transmission of Zika, dengue, and chikungunya using mechanistic models.** *PLoS neglected tropical diseases*
Mordecai, E. A., Cohen, J. M., Evans, M. V., Gudapati, P., Johnson, L. R., Lippi, C. A., Miazgowicz, K., Murdock, C. C., Rohr, J. R., Ryan, S. J., Savage, V., Shocket, M. S., Stewart Ibarra, et al
2017; 11 (4)
- **A novel framework to account for ecological drivers in the control and elimination of environmentally transmitted disease: a modelling study**
De Leo, G. A., Sokolow, S. H., Garchitorena, A., Ngonghala, C. N., Lund, A., Barry, M., Burke, K. S., Mordecai, E. A., Daily, G. C., Jones, J. H., Andrews, J. R., Bendavid, E., Luby, et al
ELSEVIER SCIENCE INC.2017: 5
- **Environmental and Social Change Drive the Explosive Emergence of Zika Virus in the Americas.** *PLoS neglected tropical diseases*
Ali, S., Gugliemini, O., Harber, S., Harrison, A., Houle, L., Ivory, J., Kersten, S., Khan, R., Kim, J., LeBoa, C., Nez-Whitfield, E., O'Marr, J., Rothenberg, et al
2017; 11 (2)
- **Mathematical models are a powerful method to understand and control the spread of Huanglongbing** *PEERJ*
Taylor, R. A., Mordecai, E. A., Gilligan, C. A., Rohr, J. R., Johnson, L. R.
2016; 4
- **A framework for priority effects** *JOURNAL OF VEGETATION SCIENCE*
Fukami, T., Mordecai, E. A., Ostling, A.
2016; 27 (4): 655–57
- **The role of competition - colonization tradeoffs and spatial heterogeneity in promoting trematode coexistence** *ECOLOGY*
Mordecai, E. A., Jaramillo, A. G., Ashford, J. E., Hechinger, R. F., Lafferty, K. D.
2016; 97 (6): 1484-1496
- **The role of drought- and disturbance-mediated competition in shaping community responses to varied environments** *OECOLOGIA*
Napier, J. D., Mordecai, E. A., Heckman, R. W.
2016; 181 (2): 621-632
- **The rise and fall of infectious disease in a warmer world.** *F1000Research*
Lafferty, K. D., Mordecai, E. A.
2016; 5
- **The role of competition - colonization tradeoffs and spatial heterogeneity in promoting trematode coexistence.** *Ecology*
Mordecai, E. A., Jaramillo, A. G., Ashford, J. E., Hechinger, R. F., Lafferty, K. D.
2016; 97 (6): 1484–96
- **Within-Host Niche Differences and Fitness Trade-offs Promote Coexistence of Plant Viruses** *AMERICAN NATURALIST*
Mordecai, E. A., Gross, K., Mitchell, C. E.
2016; 187 (1): E13-E26
- **Mapping Physiological Suitability Limits for Malaria in Africa Under Climate Change** *VECTOR-BORNE AND ZOONOTIC DISEASES*
Ryan, S. J., McNally, A., Johnson, L. R., Mordecai, E. A., Ben-Horin, T., Paaijmans, K., Lafferty, K. D.
2015; 15 (12): 718-725

- **Controls over native perennial grass exclusion and persistence in California grasslands invaded by annuals** *ECOLOGY*
Mordecai, E. A., Molinari, N. A., Stahlheber, K. A., Gross, K., D'Antonio, C.
2015; 96 (10): 2643-2652
- **Differential Impacts of Virus Diversity on Biomass Production of a Native and an Exotic Grass Host** *PLOS ONE*
Mordecai, E. A., Hindenlang, M., Mitchell, C. E.
2015; 10 (7)
- **Pathogen impacts on plant diversity in variable environments** *OIKOS*
Mordecai, E. A.
2015; 124 (4): 414-420
- **The community ecology of pathogens: coinfection, coexistence and community composition** *ECOLOGY LETTERS*
Seabloom, E. W., Borer, E. T., Gross, K., Kendig, A. E., Lacroix, C., Mitchell, C. E., Mordecai, E. A., Power, A. G.
2015; 18 (4): 401-415
- **Understanding uncertainty in temperature effects on vector-borne disease: a Bayesian approach** *ECOLOGY*
Johnson, L. R., Ben-Horin, T., Lafferty, K. D., McNally, A., Mordecai, E., Paaijmans, K. P., Pawar, S., Ryan, S. J.
2015; 96 (1): 203-213
- **Despite spillover, a shared pathogen promotes native plant persistence in a cheatgrass-invaded grassland** *ECOLOGY*
Mordecai, E. A.
2013; 94 (12): 2744-2753
- **Consequences of Pathogen Spillover for Cheatgrass-Invaded Grasslands: Coexistence, Competitive Exclusion, or Priority Effects** *AMERICAN NATURALIST*
Mordecai, E. A.
2013; 181 (6): 737-747
- **Optimal temperature for malaria transmission is dramatically lower than previously predicted** *ECOLOGY LETTERS*
Mordecai, E. A., Paaijmans, K. P., Johnson, L. R., Balzer, C., Ben-Horin, T., Moor, E., McNally, A., Pawar, S., Ryan, S. J., Smith, T. C., Lafferty, K. D.
2013; 16 (1): 22-30
- **Soil Moisture and Fungi Affect Seed Survival in California Grassland Annual Plants** *PLOS ONE*
Mordecai, E. A.
2012; 7 (6)
- **Pathogen impacts on plant communities: unifying theory, concepts, and empirical work** *ECOLOGICAL MONOGRAPHS*
Mordecai, E. A.
2011; 81 (3): 429-441
- **Competition-defense tradeoffs and the maintenance of plant diversity** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
Viola, D. V., Mordecai, E. A., Jaramillo, A. G., Sistla, S. A., Albertson, L. K., Gosnell, J. S., Cardinale, B. J., Levine, J. M.
2010; 107 (40): 17217-17222
- **Soil moisture mediated interaction between *Polygonatum biflorum* and leaf spot disease** *PLANT ECOLOGY*
Warren, R. J., Mordecai, E.
2010; 209 (1): 1-9
- **Parasites in food webs: the ultimate missing links** *ECOLOGY LETTERS*
Lafferty, K. D., Allesina, S., Arim, M., Briggs, C. J., De Leo, G., Dobson, A. P., Dunne, J. A., Johnson, P. T., Kuris, A. M., Marcogliese, D. J., Martinez, N. D., Memmott, J., Marquet, et al
2008; 11 (6): 533-546