

Nicole Nova, PhD Candidate

Department of Biology, Stanford University
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Interests: Ecology, evolution, data science, statistics, mathematical biology, disease ecology, molecular evolution, animal behavior, population dynamics, population genetics, evolutionary genomics, eco-evolutionary dynamics, global change, planetary health, & wildlife conservation.

Education

2016–2022 PhD Biology, Stanford University
2018–2020 MS Statistics, Stanford University
2007–2012 BSc, MSc Dental Surgery, Karolinska Institutet

Employment & Professional Development

2022 Cohort 2022, Rising Environmental Leaders Program (RELP),
Woods Institute for the Environment, Stanford University [Press Release](#)
2021–2022 Predoctoral Fellow, Center for Computational, Evolutionary and Human Genomics
(CEHG), Stanford University [Press Release](#)
2019–2021 Data Science Scholar, Data Science Institute, Stanford University [Press Release](#)
2018–2022 PhD Candidate, Department of Biology, Stanford University
Advisors: Erin Mordecai and Dmitri Petrov
2016 Director, Research Science Institute, Massachusetts Institute of Technology (MIT)
and Center for Excellence in Education (CEE)
2015–2016 Research Associate, Department of Biology, Duke University (PI: Katia Koelle)
2014–2015 Research Trainee, Department of Data Science,
Dana-Farber/Harvard Cancer Center (PI: Franziska Michor)
2011–2012 Mentorship Director, Research Academy for Young Scientists
2011 Exchange Student, St. Bartholomew’s and the Royal London School of Medicine
and Dentistry, Queen Mary University of London
2010 Surgical Assistant, Department of Cranio-, Maxillofacial and Oral Surgery,
Medical University of Vienna
2010–2012 Research Assistant, Department of Physiology and Pharmacology,
Karolinska Institutet (PI: Camilla Svensson)
2008–2011 Co-founder, European Dental Students’ Association (EDSA) Research Program,
(summer research exchange internship for dental students in Europe)
2008 Exchange Student, National Youth Science Forum, Australian National University
(international summer science camp)
2007 Research Intern, Department of Brain and Cognitive Sciences,
Harvard Medical School, Brigham and Women’s Hospital (PI: Jeremy Wolfe)
via Research Science Institute (summer research program hosted by MIT)
2006 Research Intern, Department of Biosciences and Nutrition, Karolinska Institutet

Awards

- 2022 Frances Lou Kallman Award (for excellence in coursework, teaching and research),
Department of Biology, Stanford University (\$1,000) [Webpage](#)
- 2021 Outstanding Paper Award (honorable mention), Disease Ecology Section,
Ecological Society of America (ESA) [Webpage](#)
- 2020 Murray F. Buell Award for Excellence in Ecology runner-up (honorable mention)
for best oral presentation of an outstanding paper by a student,
Ecological Society of America (ESA) [Press Release](#)
- 2020 Annabelle B. Bush Memorial Endowed Scholar Award,
Philanthropic Educational Organization (PEO) [Press Release](#)
- 2020 PEO Scholar Award, International Chapter of the PEO Sisterhood (\$15,000)
- 2017 Excellence in Teaching Award, Department of Biology, Stanford University [Webpage](#)
- 2007 Best Student of the Year Award (Valedictorian), Internationella Engelska Gymnasiet
- 2007 First prize, National Science Fair, Swedish Federation of Young Scientists

Grants, Scholarships & Fellowships

- 2022 Stanford Office of Graduate Education (OGE) Travel Grant (\$1,000)
- 2022 Stanford Biology EcoEvo Conference Travel Grant (\$800)
- 2021 Stanford CEHG Predoctoral Fellowship (\$16,000)
- 2020 Modeling of Infectious Disease Agent Study (MIDAS) Grant (\$600)
- 2019 Stanford Data Science Scholarship (50% salary & tuition for two years)
- 2019 Stanford Disease Ecology, Health, and the Environment Travel Grant (\$500)
- 2019 Stanford Biology EcoEvo Conference Travel Grant (\$700)
- 2018 Environmental Venture Project Grant,
Stanford Woods Institute for the Environment (\$50,000)
- 2018 The Bing Fellowship in Honor of Paul Ehrlich (salary & tuition for one year)
- 2017 Stanford Biology EcoEvo Conference Travel Grant (\$600)
- 2015 Mathematical Biosciences Institute Travel Grant (all travel & workshop expenses)
- 2013 Google Women in Tech Conference and Travel Grant (1,000 €)
- 2011 European Union Erasmus Mundus Scholarship (1,000 €)
- 2010 Karolinska Institutet Summer Research Scholarship in Medical Sciences (9,000 SEK)
- 2008 Swedish Federation of Young Scientists Fellowship (all expenses paid)
to attend National Youth Science Forum at Australian National University
- 2007 Gålöstiftelsen Study Stipend (50,000 SEK for five years of university studies)
- 2007 Knut and Alice Wallenberg Fellowship (all expenses paid)
to attend Research Science Institute at Massachusetts Institute of Technology
- 2006 Karolinska Institutet Summer Research Scholarship in Biomedicine (5,000 SEK)

Publications

*denotes co-first authorship | Google Scholar | Citations: 338 | h-index: 9 | i10-index: 9

†denotes corresponding author

Peer-Reviewed Journal Articles

15. Hopkins SR[†], Lafferty KD, Wood CL, Olson SH, Buck JC, De Leo GA, Fiorella KJ, Fornberg J, Garchitorena A, Jones IJ, Kuris AM, Kwong LH, LeBoa C, Leon AE, Lund AJ, MacDonald AJ, Metz DCG, **Nova N**, Peel AJ, Remais JV, Stewart Merrill TE, Wilson M, Bonds MH, Dobson AP, Lopez Carr D, Howard ME, Mandle L, Sokolow SH. 2022. Evidence gaps and diversity among potential win–win solutions for conservation and human infectious disease control. *The Lancet Planetary Health*. 6:e694–e705. doi:10.1016/S2542-5196(22)00148-6
14. Hopkins SR^{*†}, Jones IJ^{*}, Buck JC, LeBoa C, Kwong LH, Jacobsen K, Rickards C, Lund AJ, **Nova N**, MacDonald AJ, Lambert-Peck M, De Leo GA, Sokolow SH. 2022. Environmental persistence of the world’s most burdensome infectious and parasitic diseases. *Frontiers in Public Health*. 10:892366. doi:10.3389/fpubh.2022.892366
13. **Nova N**[†], Athni TS, Childs ML, Mandle L, Mordecai EA. 2022. Global change and emerging infectious diseases. *Annual Review of Resource Economics*. 14:1. doi:10.1146/annurev-resource-111820-024214
12. **Nova N**[†], Pagliara R, Gordon DM[†]. 2022. Individual variation does not regulate foraging response to humidity in harvester ant colonies. *Frontiers in Ecology and Evolution*. 9:756204. doi:10.3389/fevo.2021.756204
11. Glidden CK^{*†}, **Nova N**^{*†}, Kain MP, Lagerstrom KM, Skinner EB, Mandle L, Sokolow SH, Plowright RK, Dirzo R, De Leo GA, Mordecai EA. 2021. Human-mediated impacts on biodiversity and the consequences for zoonotic disease spillover. *Current Biology*. 31(19):R1342–R1361. doi:10.1016/j.cub.2021.08.070
10. **Nova N**[†]. 2021. Cross-species transmission of coronaviruses in humans and domestic mammals, what are the ecological mechanisms driving transmission, spillover, and disease emergence? *Frontiers in Public Health*. 9:717941. doi:10.3389/fpubh.2021.717941
9. Childs ML^{*}, Kain MP^{*}, Harris MJ^{*}, Kirk DG, Couper LI, **Nova N**, Delwel I, Ritchie J, Becker AD, Mordecai EA[†]. 2021. The impact of long-term non-pharmaceutical interventions on COVID-19 epidemic dynamics and control: the value and limitations of early models. *Proceedings of the Royal Society B*. 288(1957):20210811. doi:10.1098/rspb.2021.0811
8. Couper LI[†], Farner JE, Caldwell JM, Childs ML, Harris MJ, Kirk DG, **Nova N**, Shocket MS, Skinner EB, Uricchio LH, Exposito-Alonso M, Mordecai EA. 2021. How will mosquitoes adapt to climate warming? *eLife*. 10:e69630. doi:10.7554/eLife.69630

7. Hopkins SR[†], Sokolow SH, Buck JC, De Leo GA, Jones IJ, Kwong LH, LeBoa C, Lund AJ, MacDonald AJ, **Nova N**, Olson SH, Peel AJ, Wood CL, Lafferty KD. 2021. How to identify win-win interventions that benefit human health and conservation. *Nature Sustainability*. 4(4):298–304. doi:10.1038/s41893-020-00640-z
 6. Athni TS, Shocket MS, Couper LI, **Nova N**, Caldwell IR, Caldwell JM, Childress JN, Childs ML, De Leo GA, Kirk DG, MacDonald AJ, Olivarius K, Pickel DG, Winokur OC, Young HS, Cheng J, Grant EA, Kurzner PM, Kyaw S, Lin BJ, Lopez RC, Massihpour DS, Olsen EC, Roache M, Ruiz A, Schultz EA, Shafat M, Spencer RL, Bharti N, Mordecai EA[†]. 2021. The influence of vector-borne disease on human history: socio-ecological mechanisms. *Ecology Letters*. 24(4):829–846. doi:10.1111/ele.13675
 5. **Nova N**[†], Deyle ER, Shocket MS, MacDonald AJ, Childs ML, Rypdal M, Sugihara G, Mordecai EA. 2021. Susceptible host availability modulates climate effects on dengue dynamics. *Ecology Letters*. 24(3):415–425. doi:10.1111/ele.13652
- 2021 Outstanding Paper Award (honorable mention), Disease Ecology, ESA
 - 2020 Murray F. Buell Award for Excellence in Ecology (honorable mention), for best oral presentation of an outstanding paper, ESA
4. Allen WE*, Altae-Tran H*, Briggs J*, Jin X*, McGee G*, Shi A*, Raghavan R, Kamariza M, **Nova N**, Pereta A, Danford C, Kamel A, Gothe P, Milam E, Aurambault J, Primke T, Li W, Inkenbrandt J, Huynh T, Chen E, Lee C, Croatto M, Bentley H, Lu W, Murray R, Travassos M, Coull BA, Openshaw J, Greene CS, Shalem O, King G, Probasco R, Cheng DR, Silberman B, Zhang F, Lin X[†]. 2020. Population-scale longitudinal mapping of COVID-19 symptoms, behaviour and testing. *Nature Human Behaviour*. 4(9):972–982. doi:10.1038/s41562-020-00944-2
 3. Smith JR[†], Hendershot JN, **Nova N**, Daily GC. 2020. The biogeography of ecoregions: Descriptive power across regions and taxa. *Journal of Biogeography*. 47(7):1413–1426. doi:10.1111/jbi.13871
 2. Sokolow SH[†], **Nova N**, Pepin MK, Peel AJ, Pulliam JRC, Manlove K, Cross PC, Becker DJ, Plowright RK, McCallum H, De Leo GA. 2019. Ecological interventions to prevent and manage zoonotic pathogen spillover. *Philosophical Transactions of the Royal Society B*. 374(1782):20180342. doi:10.1098/rstb.2018.0342
 1. Childs ML[†], **Nova N**, Colvin J, Mordecai EA. 2019. Mosquito and primate ecology predict human risk of yellow fever virus spillover in Brazil. *Philosophical Transactions of the Royal Society B*. 374(1782):20180335. doi:10.1098/rstb.2018.0335

Submitted manuscripts under review or in revision

16. Sokolow SH[†], Jones IJ, Wood CL, Lafferty KD, Garchitorena A, Hopkins SR, Lund AJ, MacDonald AJ, **Nova N**, Le Boa C, Peel AJ, Mordecai EA, Howard ME, Buck JC, Lopez-Carr D, Barry M, Bonds M, De Leo GA. Global analysis of ecological and

socio-economic factors associated with the human burden of environmentally mediated pathogens. Under review. Preprint

17. Holcomb KM, Mathis S, Staples JE, Fischer M, Barker CM, Beard CB, Nett RJ, Keyel AC, Marcantonio M, Childs ML, Gorris ME, Rochlin I, Hamins-Puértolas M, Ray EL, Uelman JA, Freedman AS, Hollingsworth BD, Das P, Osthus D, Humphreys JM, **Nova N**, Mordecai EA, Cohnstaedt LW, Kirk DG, Kramer LD, Harris MJ, Kain MP, Reed EMX, Johansson MA. Evaluation of an open forecasting challenge to assess skill of West Nile virus neuroinvasive disease prediction. Under review. Preprint
18. Leempoel K*, **Nova N**[†], Sonawane C, Meyer JM, Hebert T, Hadly EA. The natural return of an apex predator (*Puma concolor*) to a suburban preserve triggers a behaviorally mediated trophic cascade. In revision. Preprint

Book Chapters

2. Kirk DG^{*†}, Skinner EB*, Shocket MS, Couper LI, **Nova N**, Athni TS, Pourtois JD, Farner JE, Childs ML, Nyathi S, Mordecai EA. Climate Change and Disease Ecology. In: Suzán G, Aguirre AA, Mills JM, editors. The Ecology of Infectious Diseases: Methods on Evolution, Biodiversity, and Environmental Interactions. *Oxford University Press*. In press.
1. Shocket MS[†], Anderson CB, Caldwell JM, Childs ML, Couper LI, Han S, Harris MJ, Howard ME, Kain MP, MacDonald AJ, **Nova N**, Mordecai EA. 2021. Environmental drivers of vector-borne diseases. In: Drake JM, Bonsall M, Strand M, editors. Population Biology of Vector-borne Diseases (Ecology and Evolution of Infectious Diseases Series). *Oxford University Press*. ISBN:9780198853244

Published Abstract

Van Wert M, **Nova N**, Horowitz T, Wolfe J. 2008. What does performance on one visual search task tell you about performance on another? *Journal of Vision*. 8(6):312. doi:10.1167/8.6.312

Theses

2. **Nova N**. 2022. Ecological and Evolutionary Mechanisms for Emerging Infectious Diseases: Case Studies in Humans and Mammalian Wildlife. *PhD Dissertation, Stanford University*. Committee: Erin Mordecai, Dmitri Petrov, Giulio De Leo, Marcus Feldman, and Elizabeth Hadly. PDF
1. **Nova N**. 2012. Chronic inflammation and pain: Assessment of c-Fos and ATF-3 as markers of spinal neuronal activity in a pain model of rheumatoid arthritis. *MSc Thesis, Karolinska Institutet*. Committee: Per Alstergren P, Camilla Svensson. PDF

Serving as a Reviewer

Journals I have served as a reviewer for (peer review):

BMC Public Health, Ecological Applications, Ecological Monographs, Ecology, PLoS Neglected Tropical Diseases

Media Coverage

6. Mick Kulikowski. Study Pinpoints 'Win-Win' Solutions to Protect Human Health and Conserve Ecosystems. NC State University News. August 3, 2022. news.ncsu.edu/2022/08/study-pinpoints-solutions-for-humans-and-environment/
5. Rob Jordan. Disease prevention: Stanford researchers find protecting biodiversity can protect human health. Stanford Woods Institute for the Environment. October 25, 2021. twitter.com/StanfordWoods/status/1452666263931658247
4. Isabella Backman. Stanford course explores how diseases have shaped human history. Stanford News. January 27, 2021. news.stanford.edu/2021/01/27/diseases-history-intertwined
3. Vilina Mehta. Understanding COVID-19, zoonotic viruses. The Stanford Daily. April 27, 2020. www.stanforddaily.com/2020/04/27/understanding-covid-19-zoonotic-viruses
2. Hans Bergström. An IES alumnus at the forefront of virus research. IES News. April 21, 2020. engelska.se/news/en-ies-elev-vid-fronten-av-virusforskningen
1. Rob Jordan. Stanford-developed interactive model explores how different interventions affect COVID-19's spread. Stanford News. March 30, 2020. news.stanford.edu/2020/03/30/modeling-social-distancings-impact

Oral Presentations

9. **Nova N**, Solari KA, Beckmen KB, Gilbert M, Mordecai EA, Petrov DA. 2022. Phylogenetics and genomic characteristics of canine distemper virus in Arctic foxes. Arctic Fox Conference, Norwegian Polar Institute, Longyearbyen, Svalbard.
8. **Nova N**, Deyle ER, Shocket MS, MacDonald AJ, Childs ML, Rypdal M, Sugihara G, Mordecai EA. 2022. How do nonlinear effects of climate and susceptibility interact to affect dengue dynamics? Models, Inference & Algorithms (MIA) Seminar Series, Broad Institute of MIT and Harvard, Boston, MA.
7. **Nova N**, Deyle ER, Shocket MS, MacDonald AJ, Childs ML, Rypdal M, Sugihara G, Mordecai EA. 2021. Susceptible host availability modulates climate effects on dengue dynamics. Bay Area Ecology and Evolution of Infectious Diseases (BAEEID), UC Davis, CA (held online due to COVID-19).

6. **Nova N**, Deyle ER, Shocket MS, MacDonald AJ, Childs ML, Rypdal M, Sugihara G, Mordecai EA. 2020. Empirical dynamic modeling reveals ecological drivers of dengue dynamics. Ecological Society of America (ESA) Annual Meeting, Salt Lake City, UT (held online due to COVID-19).
5. **Nova N**, Deyle ER, Shocket MS, MacDonald AJ, Childs ML, Rypdal M, Sugihara G, Mordecai EA. 2020. Empirical dynamic modeling reveals ecological drivers of dengue dynamics. Ecology and Evolution of Infectious Disease Seminar, UC Berkeley, Berkeley, CA (held online due to COVID-19).
4. **Nova N**, Sokolow SH, Bowden SE, Han B, Pepin KM, Peel AJ, Manlove K, Cross PC, Becker D, Plowright RK, McCallum HI, De Leo GA, Mordecai EA. 2019. Predictors of pathogen sharing across taxa reveal ecological levers to prevent pathogen spillover from wildlife to humans. Ecological Society of America (ESA) Annual Meeting, Louisville, KY.
3. **Nova N**. 2018. Ecological and evolutionary drivers of infectious diseases. Centre for Mathematical Biology, University of South Bohemia, Czech Republic.
2. **Nova N**. 2015. Mathematical Modeling in the Biosciences. 30th Jubilee Symposium of Research Program in Biomedicine, Karolinska Institutet, Stockholm, Sweden.
1. **Nova N**. 2015. Mathematical Modeling of Cancer and Infectious Diseases. National Science Foundation Research Experiences for Undergraduates in Mathematical Biology (invited guest speaker), University of North Carolina at Greensboro, NC.

Poster Presentations

9. **Nova N**, Solari KA, Beckmen KB, Petrov DA. 2020 (cancelled due to COVID-19). Genomic characteristics of canine distemper virus in Arctic wildlife. Annual Meeting of the Society for Molecular Biology and Evolution (SMBE), Québec City, Canada.
8. Childs ML, **Nova N**, Colvin J, Mordecai EA. 2019. Mosquito and primate ecology predict human risk of yellow fever virus spillover in Brazil. American Geophysical Union (AGU) Fall Meeting, San Francisco, CA, USA.
7. Leempoel K, Meyer J, Hebert T, **Nova N**, Hadly EA. 2018. Return of an apex predator to a suburban preserve triggers a rapid trophic cascade. Conservation Asia, Society for Conservation Biology, American University of Central Asia, Bishkek, Kyrgyz Republic.
6. **Nova N**, Deyle ER, Shocket MS, MacDonald AJ, Childs ML, Rypdal M, Sugihara G, Mordecai EA. 2018. Empirical dynamic modeling reveals that temperature and rainfall drive dengue dynamics. Ecology and Evolution of Infectious Diseases, University of Glasgow, Glasgow, UK.
5. **Nova N**, Deyle ER, Shocket MS, MacDonald AJ, Childs ML, Rypdal M, Sugihara G, Mordecai EA. 2018. Environmental factors drive dengue incidence in Puerto Rico. Stanford Global Health Research Convening, Stanford University, Stanford, CA, USA.

4. **Nova N**, Deyle ER, Shocket MS, MacDonald AJ, Childs ML, Rypdal M, Sugihara G, Mordecai EA. 2017. Environmental factors driving dengue incidence in Central and South America. *Ecology and Evolution of Infectious Diseases*, University of California Santa Barbara, CA, USA.
3. **Nova N**, Koelle K. 2015. Modeling the development of neutralizing antibody breadth in chronic-stage HIV infection. Triangle Center for Evolutionary Medicine Symposium, The Solution Center in Research Triangle Park, Durham, NC, USA.
2. **Nova N**, Bas D, Svensson K. 2010. Assessment of c-Fos as a marker of spinal neuronal activity in a pain model of rheumatoid arthritis. Annual Medical Sciences Symposium, Karolinska Institutet, Stockholm, Sweden.
1. **Nova N**, Robertson K. 2006. Activation of Liver X Receptor affects the function and differentiation of osteoclasts. Biomedical Sciences Symposium, Karolinska Institutet, Stockholm, Sweden.

Teaching

- 2021 Guest Lecturer, Stanford University
Globally Emerging Zoonotic Diseases (COMP MED 84Q)
- 2019 Teaching Assistant, Stanford University
Ecology and Evolution of Infectious Disease in a Changing World (BIO 2N)
- 2017 Teaching Assistant, Stanford University
Fundamentals of Molecular Evolution (BIO 113/244)
- 2017 Teaching Assistant, Stanford University
Introduction to Research in Ecology and Evolutionary Biology (BIO 47)

Services

- 2020 Research mentor, Research Science Institute (RSI),
Center for Excellence in Education (CEE). Mentee: Shreya Ramachandran.
- 2019 Research mentor, Biology Summer Undergraduate Research Program (B-SURP),
Stanford University, Stanford, CA. Mentees: Rachael Wang and Allen Huang.
- 2019 Co-Organizer, Planetary Health Annual Meeting, Planetary Health Alliance,
Stanford University, Stanford, CA.
- 2019 Co-Organizer, Organized Oral Session, Ecological Levers to Improve Human
Health, Ecological Society of America (ESA) Annual Meeting, Louisville, KY.
- 2016–2017 Chair, Biology Department Seminar Series Speaker Selection Student Committee,
Stanford University, Stanford, CA.
- 2008–2009 Co-organizer, National Science Fair, Swedish Federation of Young Scientists,
Stockholm, Sweden.

Workshops & Certificates

- 2020 Annual Summer Institute in Statistics and Modeling in Infectious Diseases (SISMID),
University of Washington, Seattle, WA (held online due to COVID-19).
- 2018 Genomics of Wildlife Diseases, Colorado State University, Fort Collins, CO.
- 2018 Wilderness First Aid Certificate, Wilderness Medicine Training Center, WA.
- 2015 Evolutionary Game Theory Workshop, Mathematical Biosciences Institute,
Ohio State University, Columbus, OH.
- 2013 2.03x: Dynamics, MIT via edX. Certificate
- 2013 PHYS102x: Electricity & Magnetism, Rice University via edX. Certificate
- 2013 BIO465x: Neuronal Dynamics, EPFL via edX. Certificate
- 2013 EuroBSDcon 2013, St. Julian's, Malta.
- 2010 Maxillofacial International Student Training Course,
Chiemsee-Akademie, Seebruck, Germany.