Cara E. Brook
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Education

2012-2017 **Ph.D. Ecology and Evolutionary Biology, Princeton University**
Elucidating mechanisms of viral hosting in bat reservoirs for emerging zoonotic disease. Advised by: Dr. Andrew P. Dobson

2012-2014 **M.Sc. Ecology and Evolutionary Biology, Princeton University**
Deciphering the role of bats as reservoirs in emerging disease.
Advised by: Dr. Andrew P. Dobson

2006-2010 **B.S. Earth Systems, Stanford University**
The Synanthropizatic Raven: Anthropogenic resource use and the invasion of Corvus corax *in Yosemite National Park.* Advised by: Dr. Elizabeth Hadly

Appointments

2017-present **Miller Postdoctoral Fellow**, UC Berkeley, CA
2012-2017 **PhD student**, Princeton University, NJ
2012 **Field Technician**, US Geological Survey, Superior National Forest, MN
2011 **GIS Technician**, Peninsula Open Space Trust, Palo Alto, CA
2011 **Project Manager**, Smithsonian Inst., Mpala Research Centre, Kenya
2010 **Conservation Intern**, World Wildlife Fund, Vondrozo, Madagascar

Awards and Fellowships

2017-2020 Miller Postdoctoral Fellowship, UC Berkeley.
2013-2017 National Science Foundation, Graduate Research Fellowship.
2013 US DOD: National Defense, Science, and Engineering Graduate Fellowship. *(Declined in favor of NSF)*
2010 Firestone Medal, Undergrad Research Excellence, Stanford University
2010 Earth Systems Award, Senior Thesis Excellence, Stanford University

Peer-Reviewed Publications *(in reverse chronological order)*

In Review/Revision

1. **Brook CE,** Ng M, Boots M, Dobson A, Graham A, Grenfell B, Chandran KC, van Leeuwen A. Submitted. From within-host persistence to zoonotic emergence: Understanding bats as viral reservoirs*. PNAS.*
2. Guth S, Visher E, Boots M*, and **Brook CE***. *In Revision*. Host phylogenetic distance drives trends in virulence and transmissibility across the animal-human interface. *Philosophical Transactions of the Royal Society.* ***=equal senior contributions.***

2019

3. **Brook CE,** Ranaivoson HC, Broder CC, Cunningham AA, Héraud J-M, Peel AJ, Gibson L, Wood JLN, Metcalf CJE*, and Dobson AP*. 2019. Disentangling serology to elucidate henipa- and filovirus transmission in Madagascar fruit bats. *Journal of Animal Ecology.* doi: 10.1111/1365-2656.12985. **=equal senior contributions.*
4. **Brook CE,** Ranaivoson HC, Andriafidison D, Ralisata M, Razafimanahaka J, Héraud JM, Dobson AP, and Metcalf CJE. 2019. Population trends for two Malagasy fruit bats. *Biological Conservation.* 234:165-171. doi: 10.1016/j.biocon.2019.03.032.

5. Ranaivoson HC, Héraud JM, Goethert HK, Telford SR, Rabetafika L* and **Brook CE***. 2019. Babesial infection in the Madagascan flying fox, *Pteropus rufus* É. Geoffroy, 1803*. Parasites & Vectors.* 12(51): 1307101933. doi: 10.1186/s13071-019-3300-7. **=equal senior contributions.*

2018

6. **Brook CE,** Herrera JP, Borgerson C, Fuller E, Andriamahazoarivosoa P, Rasolofoniaina BJR, Randrianasolo JLRR, Rakotondrafarasata ZRE, Randriamady HJ, Dobson AP, Golden CD. 2018. Population viability and harvest sustainability for Madagascar lemurs*. Conservation Biology* doi: 10.1111/cobi.13151.

2017

7. **Brook CE**, Bai Y, Yu EO, Ranaivoson HC, Shin H, Dobson AP, Metcalf CJE*****, Kosoy MY***** and Dittmar K*****. 2017. Elucidating transmission dynamics and host-parasite-vector relationships for rodent-borne *Bartonella* spp. in Madagascar. *Epidemics* 20:56-66*.* doi:10.1016/j.epidem. 2017.03.004. ***** *= equal senior contributions.*

2016

8. Wesolowski A*****, Mensah K*****, **Brook CE***, Andrianjafimasy M, Winter A, Buckee CO, Razafindratsimendresy R, Tatem AJ, Heraud J-M◆, and Metcalf CJE◆. 2016. Introduction of Rubella-Containing-Vaccine to Madagascar: Implications for roll-out and local elimination across low-income countries. *Journal of the Royal Society Interface.* 13(177): 20151101. doi:10.1098/rsif.2015.110. ** = equal lead contributions;* ◆*= equal senior contributions.*

2015

9. **Brook CE**, Beauclair R, Ngwenya O, Worden L, Ndeffo-Mbah M, Lietman TM, Satpathy SK, Galvani AP, and Porco TP. 2015. Spatial heterogeneity in projected leprosy trends in India. *Parasites & Vectors* 8(542): 2-11. doi: 10.1186/s13071-015-1124-7.

10. Rist CL, Ngonghala CN, Garchitorena A, **Brook CE**, Ramananjato, Miller AC, Randrianarivelojosia M, Wright PC, Gillespie TR, and Bonds MH. 2015. Modeling the burden of poultry disease on the rural poor in Madagascar. *One Health*. 1:60-65. doi: 10.1016/j.onehlt.2015.10.002.

11. **Brook CE**, Bai Y, Dobson AP, Osikowicz L, Ranaivoson HC, Zhu Q, Kosoy MY, and Dittmar K. 2015. Bartonella spp. in fruit bats and blood-feeding ectoparasites in Madagascar. *PLoS Neglected Tropical Diseases.* 10 (2):e0003532. doi:10.1371/journal.pntd.0003532.

12. **Brook CE** and Dobson AP. 2015. Bats as 'special' reservoirs for emerging zoonotic pathogens. *Trends in Microbiology.* 23(3):172-180. doi:10.1016/j.tim.2014.12.00.

13. Guyton J and **Brook CE**. 2015. African Bats: Conservation in the Time of Ebola. *Therya.* 6(1): 69-88. doi: 10.12933/therya-15-244.

14. Young HS, McCauley DJ, Dirzo R, Goheen JR, Agwanda B, **Brook CE**, Castillo EO, Ferguson AW, Kinyua SN, McDonough MM, Palmer TM, Pringle RM, Young TP, and Helgen KM. 2015. Context -dependent effects of large wildlife declines on small mammal communities in central Kenya. *Ecological Applications* (25):348–60. doi:10.1890/14-0995.1.

2013

15. **Brook CE**, Bernstein DP, and Hadly EA. 2013. Human food subsidies and Common Raven occurrence in Yosemite National Park, CA. *Western Birds* 44(2):127-34.

Selected Conference Presentations

2018 *Fall Biology Seminar Series,* University of San Francisco, CA. ***invited talk**
2018 *Ecology and Evolution of Infectious Diseases*, University of Glasgow, Scotland. ***invited talk**
2018 *Modeling Insights into Epidemiology and Ecology,* Institut Pasteur de Madagascar, Antananarivo, Madagascar. ***invited talk**
2017 *International Bat Infectious Diseases Conference.* Colorado State University, Fort Collins, CO.
2017 *Ecology and Evolution of Infectious Diseases Conference.* UC Santa Barbara, CA.
2015 *North American Society Bat Research, Annual Meeting.* Monterey, CA. ***session organizer**
2015 *Ecological Society of America – Annual Meeting.* Baltimore, Maryland.
2015 *African Small Mammal Symposium.* Vahatra, Mantasoa, Madagascar.
2014 *Ecology and Evolution of Infectious Diseases Conference.* Colorado State, Fort Collins, CO.

Research Grants

2018-present **DARPA PREdicting Emerging Pathogenic Threats (PREEMPT).**
Lead PI: RK Plowright. co-PI with H Arguilar-Carreno, N Bharti, P Ebby, E Gurley, B Han, PJ Hudson, JO Lloyd-Smith, H McCallum, L McGuire, V Munster, CR Parrish, AJ Peel, O Restif, T Schountz. $10,000,000.
"Preventing emergence and spillover of bat viruses in high-risk global hotspots"**.**

2018-present **Center for Emerging and Neglected Tropical Diseases, Thomas C. Alber Science and Engineering Fellowship.** *PI.* $10000.
"A transcriptomic window into zoonotic bat virus seasonality in Madagascar."

2017-present **National Institutes of Health, Intl Research in Infectious Diseases (R01).**
Senior/Key Personnel with co-PIs JM Héraud, CJ Metcalf, C Golden, and LF Wang (PI status not permitted for graduate students at time of submission). $625000.
"Investigating seasonal drivers of viral zoonoses from Madagascar fruit bats."

2016-2017 **Princeton Environmental Institute, Walbridge Graduate Award.** *PI.* $10000.
"Climate Change, Resource Scarcity, & Emerging Fruit Bat Zoonoses in Madagascar."

2016-2017 **National Science Foundation, Doctoral Dissertation Improvement Grant.**
co-PI with AP Dobson and AL Graham. $13000.
"Within-host seasonal drivers of pathogen dynamics in a fruit bat reservoir."

2015-2016 **PIVOT Research Award.** *co-PI with AP Dobson and J-M Héraud.* $15000.
"Investigating spillover of viral hemorrhagic fevers from fruit bats in Madagascar."

2015-2016 **National Geographic Society: Waitt Grant.** *PI.* $15000.
"Investigating risks for Ebola virus spillover from Madagascar fruit bats."

2013-2014 **Lubee Bat Conservancy. Bacardi Conservation & Research Fund.** *PI.* $5000.
"Bushmeat harvesting impacts on risk for henipavirus spillover among fruit bats in Madagascar."

2013-2014 **Bat Conservation International. Student Research Scholarship.***PI.* $3200.
"Bushmeat harvesting impacts on population dynamics and corresponding risk for henipavirus spillover in Malagasy fruit bats."

2013-2014 **The Explorer's Club. Exploration Fund.** *PI.* $2250.
"Mechanisms for viral persistence among mixed species fruit bat populations in Madagascar."

2013-2014 **Bill and Melinda Gates Foundation: Grand Challenges in Global Health Explorations.** *co-PI with MH Bonds, PC Wright,* and *TR Gillespie.* $100,000.
"Quantifying the economic burden of disease in Ranomafana NP, Madagascar. "

2013-2014 **Princeton University: Health Grand Challenges Grant.** *PI.* $5000.
"Biodiversity and human livelihood: Quantifying vector-control impact of insectivorous bats on human malaria burden in Ranomafana, Madagascar."

2013 **American Society of Mammalogist: Grants-in-Aid.** *PI.* $1500.

"Mammalian Biodiversity, Metapopulation Connectivity, & Potential for Zoonosis."

2013 **National Geographic Society: Young Explorer Grant.** *PI.* $5000.
"Habitat Modification and the Ecology of Plague Emergence in Madagascar."

2013 **Princeton University: Health Grand Challenges Grant.** *PI.* $1200.
"Habitat Modification and Plague Emergence in Madagascar."

2009-2010 **Stanford Vice Provost Undergraduate Education Major Grant.** *PI.* $5200.
"Anthropogenic resources and Common Raven invasion in Yosemite National Park."

Teaching Experience

2016-present **E²M²: Ecological and Epidemiological Modeling in Madagascar.**
Founder, Instructor: **https://carabrook.github.io/E2M2**
- Design and deliver lectures and exercises for introductory programming (R) workshop for Malagasy students in biology, medicine, public health

2015-present **International Clinics on Infectious Disease, Dynamics, and Data.**
Workshop Faculty: ici3d.org
- Design and deliver lectures and exercises for introductory programming (R) workshop for African/N. American students in biology, medicine, public health

2014 **Evolution & Behavior of Sexes.** EEB 301. Princeton Univ. *Assistant-in-Instruction.*
- Taught weekly discussion section, designed exams and assignments for upper-division seminar in Ecology and Evolutionary Biology (EEB)

2012-2013 **Life on Earth.** EEB 211. Princeton University. *Assistant-in-Instruction.*
- Taught weekly discussion section, designed exams, labs and assignments for primary introductory course in the EEB major

2009 **Introduction to Earth Systems.** ES10. Stanford University. *Teaching Assistant*.
- Taught weekly classroom section, wrote and graded assignments, and designed curriculum, the primary introductory course in the ES major

Advising

UC Berkeley Graduate Students (informal committee member)**:**

Sarah Guth (Ph.D., *Current*).
Seasonal movement and spatial infection dynamics in Madagascar fruit bats

Mattina Allonge (Ph.D., *Current*).
Seasonal resource shifts and investment in growth, reproduction, and immunity in Madagascar fruit bats

University of Antananarivo Advisees:

Angelo Andrianiaina (Ph.D., *Current*).
Population dynamics of fruit bat ectoparasites in Madagascar

Christian Ranaivoson (Ph.D., *Current*).
Seasonality of Babesia spp. infection in Madagascar fruit bats

Princeton Undergraduate Advisees:

Yun-Yun Li (2016, undergraduate research exchange)

Emily Yu (2015, senior thesis)
A study on Bartonella spp. prevalence, strain diversity, & dynamics in Rattus rattus in Madagascar

Evaline Cheng (2014, senior thesis)
Modeling the impacts of biodiversity loss on malaria transmission in Madagascar

Certifications, Languages, Skills

Certifications:
Wilderness First Responder (2014). PADI Open Water SCUBA Diver (2008).

Language:
French (highly proficient written and spoken). Malagasy (highly proficient spoken).

Computer:
R, MatLab, C++, ArcGIS, Microsoft Office (Powerpoint, Word, Excel)

Journalism and Other Writing

- National Geographic Society Voices (over 30 articles related to my work in Madagascar): http://voices.nationalgeographic.com/author/carabrook/
- Popular science writing in Princeton Discovery Research magazine: https://discovery.princeton.edu/2016/11/15/big-answers-from-small-creatures/
- Popular science writing in the SACEMA quarterly: http://sacemaquarterly.com/