

Cara E. Brook

Department of Integrative Biology, University of California, Berkeley, CA 94720

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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 Synanthropic 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. *(11 Recipients)*
- 2013-2017 National Science Foundation, Graduate Research Fellowship. *(200 Recipients)*
- 2013 US DOD: National Defense, Science, and Engineering Graduate Fellowship.
(150 Recipients; declined in favor of NSF)
- 2010 Firestone Medal, Undergrad Research Excellence, Stanford University *(40 Recipients)*
- 2010 Earth Systems Award, Senior Thesis Excellence, Stanford University *(Sole Recipient)*

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

1. **Brook CE**, Ranaivoson HC, Broder CC, Cunningham AA, Héraud J-M, Peel AJ, Gibson L, Wood JLN, Metcalf CJE*, and Dobson AP*. In Review. Deciphering serology to elucidate transmission: Evidence of waning immunity and diminished survivorship in filo- and henipavirus seropositive Madagascar fruit bats. *PLoS Biology*. *=equal senior contributions
2. **Brook CE**, Herrera JP, Borgerson C, Fuller E, Andriamahazoarivosoa P, Rasolofoniaina BJR, Randrianasolo JLRR, Rakotondrafarasata ZRE, Randriamady HJ, Dobson AP, Golden CD. In Review. Population viability and harvest sustainability for Madagascar lemurs. *Conservation Biology*.
3. **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.

4. 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.
5. **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.
6. Rist CL, Ngonghala CN, Garchitorena A, **Brook CE**, Ramananjato, Miller RC, Randrianarivelojosa 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.
7. **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.
8. **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.
9. 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.
10. 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.
11. **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

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| 2017 | <i>International Bat Infectious Diseases Conference</i> . Colorado State University, Fort Collins, CO. |
| 2017 | <i>Ecology and Evolution of Infectious Diseases Conference</i> . UC Santa Barbara, CA. |
| 2016 | <i>Clinic on the Meaningful Modeling of Epidemiological Data</i> , African Institute for Mathematical Sciences (AIMS), Cape Town, South Africa. |
| 2015 | <i>North American Society Bat Research, Annual Meeting</i> . Monterey, CA. *session organizer |
| 2015 | <i>Ecological Society of America – Annual Meeting</i> . Baltimore, Maryland. |
| 2015 | <i>Clinic on the Meaningful Modeling of Epidemiological Data</i> , AIMS, Cape Town, South Africa. |
| 2015 | <i>African Small Mammal Symposium</i> . Vahatra, Mantasoa, Madagascar. |
| 2014 | <i>Ecology and Evolution of Infectious Diseases Conference</i> . Colorado State, Fort Collins, CO. |

Research Grants

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| 2017-present | National Institutes of Health, Intl Research in Infectious Diseases (R01).
Leading Researcher 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. <i>co-PI with AP Dobson and AL Graham. \$13000.</i> "Within-host seasonal drivers of pathogen dynamics in a fruit bat reservoir."
2015-2016	PIVOT Research Award. <i>co-PI with AP Dobson and J-M Héraud. \$15000.</i> "Investigating spillover of viral hemorrhagic fevers from fruit bats in Madagascar."
2015-2016	National Geographic Society: Waite Grant. <i>PI. \$15000.</i> "Investigating risks for Ebola virus spillover from Madagascar fruit bats."
2013-2014	Lubee Bat Conservancy. Bacardi Conservation & Research Fund. <i>PI. \$5000.</i> "Bushmeat harvesting impacts on risk for henipavirus spillover among fruit bats in Madagascar."
2013-2014	Bat Conservation International. Student Research Scholarship. <i>PI. \$3200.</i> "Bushmeat harvesting impacts on population dynamics and corresponding risk for henipavirus spillover in Malagasy fruit bats."
2013-2014	The Explorer's Club. Exploration Fund. <i>PI. \$2250.</i> "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. <i>co-PI with MH Bonds, PC Wright, and TR Gillespie. \$100,000.</i> "Quantifying the economic burden of disease in Ranomafana NP, Madagascar."
2013-2014	Princeton University: Health Grand Challenges Grant. <i>PI. \$5000.</i> "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. <i>PI. \$1500.</i> "Mammalian Biodiversity, Metapopulation Connectivity, & Potential for Zoonosis."
2013	National Geographic Society: Young Explorer Grant. <i>PI. \$5000.</i> "Habitat Modification and the Ecology of Plague Emergence in Madagascar."
2013	Princeton University: Health Grand Challenges Grant. <i>PI. \$1200.</i> "Habitat Modification and Plague Emergence in Madagascar."
2009-2010	Stanford Vice Provost Undergraduate Education Major Grant. <i>PI. \$5200.</i> "Anthropogenic resources and Common Raven invasion in Yosemite National Park."

Teaching Experience

2016-present	E²M²: Ecological and Epidemiological Modeling in Madagascar. <i>Founder, Instructor:</i> http://metcalflab.princeton.edu/e2m2-application/ - 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. <i>Workshop Faculty:</i> 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. <i>Assistant-in-Instruction.</i> - 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. <i>Assistant-in-Instruction.</i> - 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. <i>Teaching Assistant.</i> - Taught weekly classroom section, wrote and graded assignments, and designed curriculum, the primary introductory course in the ES major

Advising

University of Antananarivo Advisees:

Christian Ranaivoson (Ph.D., *Current*).

Seasonality of Babesia spp. infection in Madagascar fruit bats

Miora Rasolomanantsoa (M.Sc., 2016)

Leukocyte diversity and immunological response in Madagascar fruit bats

Princeton Undergraduate Advisees:

Yun-Yun Li (2016, junior paper)

Exploring seasonal diet variation of Madagascar fruit bats via C/N isotope analysis

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 (fluent)

Malagasy (fully proficient)

Computer:

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

Journalism and Other Writing

- As a National Geographic Society grant recipient, I have written over 30 popular press articles in the NGS Voices forum on both scientific and cultural topics related to my work in Madagascar:
<http://voices.nationalgeographic.com/author/carabrook/>
- I have also published popular science writing in the SACEMA quarterly:
<http://sacemaquarterly.com/>