

ANNI YANG

Department of Geography and Environmental Sustainability
University of Oklahoma
100 East Boyd St, SEC Suite 654, Norman, OK
Phone: (517) 755-8522
Anni.Yang@ou.edu

RESEARCH INTERESTS

Medical and Health Geography, Disease ecology, Infectious diseases, Spatial Statistics, Wildlife-livestock-human interface, Dynamic spatial simulation models

EDUCATION

PhD	2019	University of Florida	Geography Minor in Numerical Epidemiology
MS	2016	Michigan State University	Geography
BS	2014	Hohai University (China)	Surveying and Mapping

RESEARCH EXPERIENCE

- 2019.5 – 2021.7 Post-doc Fellow, Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins, CO, USA
National Wildlife Research Center, USDA APHIS Wildlife Service, 4101 Laporte Ave, Fort Collins, CO, USA
Strategies for disease risk assessment and control based on host movement (USDA-APHIS; PIs: Dr. George Wittemyer and Dr. Kim Pepin)
- 2016.8 – 2019.5 Research Assistant, Spatial Epidemiology and Ecology Research Lab, Emerging Pathogen Institute, Department of Geography, University of Florida, Gainesville, FL, USA
Spatio-temporally explicit estimation of R_0 for pathogens with environmentally-maintained reservoirs (EEID/NIH; PI: Dr. Jason K. Blackburn)
- 2014.8 – 2016.8 Research Assistant, Health/GIS Lab, Center of Global Change and Earth Observation, Michigan State University, East Lansing, MI, USA
- 2013.6 – 2014.6 Research Assistant, Department of Geomatics, Hohai University, Nanjing, Jiangsu Province, China

PUBLICATION (* indicates corresponding authors)

- 2021 **Yang, Anni***, Raoul K. Boughton, Ryan S. Miller, Bethany Wight, Wesley M. Anderson, James C. Beasley, Kurt C. VerCauteren, Kim M. Pepin, George Wittemyer. Spatial variation in direct and indirect contact rates at the wildlife-livestock interface for informing disease management. *Preventive Veterinary Medicine*, 194, 105423. DOI: <https://doi.org/10.1016/j.prevetmed.2021.105423>.

- 2021 He, Yaqian, Rongting Xu*, Di Yang, **Anni Yang**, Jian Chen. Satellite-detected ammonia changes in the United States: natural or anthropogenic impacts. *Science of Total Environment*. DOI: <https://doi.org/10.1016/j.scitotenv.2021.147899>.
- 2021 Yang, Di, **Anni Yang***, Jue Yang, Rongting Xu, Han Qiu. Unprecedented Western Bird Die-off: Citizen-based Analysis of the Factors Influencing Mass Mortality Events in Space and Time. *Geohealth*. DOI: <https://doi.org/10.1029/2021GH000395>.
- 2021 **Yang, Anni***, Peter Schlichting, Mark Wilber, Bethany Wight, Wesley Anderson, Sarah Chinn, Ryan S. Miller, Kurt VerCauteren, James C. Beasley, Raoul Boughton, George Wittemyer, Kim M. Pepin. Effects of social structure and management on risk of disease establishment in wild pigs. *Journal of Animal Ecology*. DOI: <https://doi.org/10.1111/1365-2656.13412>.
- 2020 **Yang, Anni**, Kelly M. Proffitt, Valpa Asher, Sadie J. Ryan, Jason K. Blackburn*. Sex-specific Elk Resource Selection during the Anthrax Risk Period. *Journal of Wildlife Management and Wildlife Monographs* 84, no. 7: 1-11. DOI: <https://doi.org/10.1002/jwmg.21952>.
- 2020 **Yang, Anni**, Juan Pablo Gomez, Jason K. Blackburn*. "Exploring environmental coverages of species: a new variable contribution estimation methodology for rulesets from the genetic algorithm for rule-set prediction". *PeerJ*, 8, e8968. DOI: <https://doi.org/10.7717/peerj.8968>.
- 2020 **Yang, Anni**, Jocelyn C. Mullins, Matthew Van Ert, Richard A. Bowen, Ted L. Hadfield, Jason K. Blackburn*. "Predicting the geographic distribution of the Bacillus anthracis A1.a/Western North America Sub-lineage for the Continental United States: new outbreaks, new genotypes, and new climate data". *American Journal of Tropical Medicine and Hygiene* 102, no. 2: 392-402. DOI: <https://doi.org/10.4269/ajtmh.19-0191>.
- 2019 **Yang, Anni**, Juan Pablo Gomez, Catherine G. Haase, Kelly M. Proffitt, Jason K. Blackburn*. "Effects of Brucellosis Serologic Status On Physiology and Behavior Of Rocky Mountain Elk (Cervus Canadensis Nelsoni) in Southwestern Montana, USA." *Journal of wildlife diseases* 55, no. 2: 304-315. DOI: <https://doi.org/10.7589/2018-01-011>.
- 2019 Yang, Di*, **Anni Yang**, Han Qiu, Yao Zhou, Hannah Herrero, Chiung-Shiuan Fu, Qiang Yu, and Jingyin Tang. "A Citizen-Contributed GIS Approach for Evaluating the Impacts of Land Use on Hurricane-Harvey-Induced Flooding in Houston Area." *Land* 8, no. 2: 25. DOI: <https://doi.org/10.3390/land8020025>.
- 2019 Sloyer, Kristin E., Nathan D. Burkett-Cadena, **Anni Yang**, Joseph L. Corn, Stacey L. Vigil, Bethany L. McGregor, Samantha M. Wisely, and Jason K. Blackburn*. "Ecological niche modeling the potential geographic distribution of four Culicoides species of veterinary significance in Florida, USA." *PloS one* 14, no. 2: e0206648. DOI: <https://doi.org/10.1371/journal.pone.0206648>.
- 2017 **Yang, Anni***, Joseph P. Messina, Sue C. Grady, and Raechel A. White. "Cost-Benefit Analysis of Tsetse Fly Control in Tanzania." *Papers in Applied Geography* 3, no. 2: 182-195. DOI: <https://doi.org/10.1080/23754931.2017.1299634>.

- 2015 Wu, Susie. R.*, Michael. Green, Jiquan. Chen, Ying Tang, **Anni Yang**. 2015. Visual Persuasion of Green Building Design on Influencing Occupants' Pro-Environmental Behaviors, Architectural Science Association (ASA) Conference, Melbourne Australia.
- 2014 **Yang, Anni***, Yahui Xu, Hongjun Su. 2014. Urban Built-up Land Extraction and Change Detection Analysis Using Built-up Indexes, *Chinese Geomatics & Spatial Information Technology* 36, no. 10: 75-78. DOI: 10.3969/j.issn.1672-5867.2014.08.009.
- 2013 **Yang, Anni***, Y. Zhang, Z. Xu, X. Lin, X. Lu. 2013. Evaluation Measures of Public Web Map Services Based on WebGIS, *Geomatics & Spatial Information Technology* 37, no. 8: 30-34. DOI:10.3969/j.issn.1672-5867.2013.10.023.
- 2013 Zhang, Yingtong*, **Anni Yang**, Zhiyuan Xu, Xiaopeng Lu, Shandong Wang. 2013. Design and Implementation of a Mobile Grid Marketing Application based on GIS/GPS/RS Technology, *Chinese Geospatial Information* 11, no. 6: 103-105. DOI: 10.11709/j.issn.1672-4623.2013.06.035.
- 2013 Xu, Zhiyuan*, Ruixuan Li, Yingtong Zhang, **Anni Yang**. 2013. Exploration of the Positioning Performance Based on Different Brands of Cell Phone, *Chinese Journal of Navigation and Positioning*, no. 4: 23-24. DOI:10.3969/j.issn.2095-4999.2013.04.022.

Manuscript in Revision/under Review

Lee, Shinyoung, Peixin Fan, Ting Liu, **Anni Yang**, Raoul Boughton, Kim Pepin, Ryan Miller, Kwangcheol Casey Jeong*. Transmission Pathways of a Third Generation Cephalosporin Antibiotic Cefotaxime Resistant Bacteria at the Wildlife-Livestock Interface. *Biology Communication* (under review).

Haase, Catherine, **Anni Yang**, Kristina McNyset, Jason Blackburn*. GARPTools: R software for data preparation and model evaluation of GARP models. *Ecography* (in revision)

Manlove, Kezia, Mark Wilber, Lauren White, Guillaume Bastille-Rousseau, **Anni Yang**, Marie L. J. Gilbertson, Meggan Craft, Paul Cross, George Wittemyer, Kim Pepin. Bridging movement and disease ecology to improve spatial models of transmission. *Ecology Letters*. (under review)

Wilber, Mark, **Anni Yang**, Kezia R. Manlove, Ryan S. Miller, George Wittemyer, Kim M. Pepin. Movement-driven modeling of spatio-temporal infection dynamics. *Ecology Letters*. (under review)

Manuscript in Preparation

Shylo Johnson, Sam Mills, **Anni Yang**, Johanna Lange, Justin Fischer, Kim Pepin, Kurt VerCauteren, Amy Gilbert. Improving the efficiency of Oral Rabies Vaccination (ORV) baiting strategies using skunk movement data. *Journal of Wildlife Management*.

Maria G. Uribasterra, Jeremy P. Orange, **Anni Yang**, Samantha M. Wisely, Jason K. Blackburn. White-tailed deer contact rates on a high-fenced property in northern Florida. *Movement Ecology*.

BLOGS, REPORTS, AND INTERVIEWS

- 05/20/
2021 Morgan Mitchell (reporter). Study finds wildfires contribute to migratory bird die-offs. *Durango Herald*. <https://www.durangoherald.com/articles/study-finds-wildfires-contribute-to-migratory-bird-die-offs/>.
- 04/22/
2021 Jesse Hughes (reporter). Study: Mass bird deaths in Colorado due to toxic gases from wildfires. *The Denver Channel*. <https://www.thedenverchannel.com/money/science-and-tech/study-mass-bird-deaths-in-colorado-due-to-toxic-gases-from-wildfires>.
- 03/26/
2021 Joshua Rapp Learn (reporter). Mass Bird Die-Off Linked to Wildfires and Toxic Gases. *EOS*. <https://eos.org/research-spotlights/mass-bird-die-off-linked-to-wildfires-and-toxic-gases>.
Wildfire Today. <https://wildfiretoday.com/2021/03/27/mass-bird-die-off-linked-to-wildfires-and-toxic-gases/>.
Tech and Science Post. <https://techandsciencepost.com/news/science/mass-bird-die-off-linked-to-wildfires-and-toxic-gases/>.
Phys Org. <https://phys.org/news/2021-03-mass-bird-die-off-linked-wildfires.html>.

CONFERENCES AND PRESENTATIONS

- 2021 **Anni Yang**, Di Yang, Jue Yang, Rongting Xu, Han Qiu. Unprecedented Migratory Bird Die-off: A Citizen-based Analysis on the Spatiotemporal Patterns of Mass Mortality Events in the Western United States. Ecological Society of America Annual Meeting. (Online)
- 2021 Blackburn, Jason, Morgan Walker, **Anni Yang**, Colin Carlson, Samuel Canfield, Diansy Zincke, Martin Hugh-Jones, Ted Hadfield. Redefining the Texas Anthrax Triangle: Ecological Niche Modeling Specific Genetic Lineages of *Bacillus anthracis*. *Association of American Geographer (AAG) Annual Meeting*. (Online)
- 2021 **Yang, Anni**, Raoul K. Boughton, Ryan S. Miller, Bethany Wight, Wesley M. Anderson, James C. Beasley, Kurt C. VerCauteren, Kim M. Pepin, George Wittemyer. Modeling spatial variation in direct and indirect contact rates at the wildlife-livestock interface for disease management. *Front Range Student Ecology Symposium*. CSU. Fort Collins, CO (Online).
- 2021 **Yang, Anni**. Missing Links between host movement and disease Risk: Understanding Spatial Processes of the Infectious Disease Transmission in the Ecosystem. *Invited Departmental Seminar at Department of Biological Sciences, Texas Tech University*. Lubbock, TX (Online)
- 2020 **Yang, Anni**, Peter Schlichting, Mark Wilber, Bethany Wight, Wesley Anderson, Sarah Chinn, Ryan S. Miller, Kurt VerCauteren, James C. Beasley, Raoul Boughton, George Wittemyer, Kim M. Pepin. Effects of social structure and management on

- risk of disease establishment in wild pigs. *International Wild Pig Conference*. Jacksonville, FL (Online).
- 2020 **Yang, Anni**, George Wittemyer, Kim M. Pepin. How Do Landscape Features Predict Contact? -- Resource-driven Contacts for Feral Swine. *Workshop for Predicting Spatial Disease Dynamics on Changing Landscapes from Animal Movement and Behavior*. St. Paul, MN (Online).
- 2019 **Yang, Anni**, Multi-scale Modeling of Infectious Disease Transmission. *FWCB invited Seminar*. Fort Collins, CO
- 2019 **Yang, Anni**, Peter Schlichting, Mark Wilber, Bethany Wight, Wesley Anderson, Sarah Chinn, Ryan S. Miller, Kurt VerCauteren, James C. Beasley, Raoul Boughton, George Wittemyer, Kim M. Pepin. Estimating Contact Structure among Wild Pigs: Implications for African Swine Fever Transmission and Management. *GeoVet Conference*. Davis, CA
- 2019 Jason K. Blackburn, **Anni Yang**. Modeling Bacillus anthracis in Texas and estimating deer risk in the enzootic zone. *Wildlife Disease Association International Conference*. Tahoe City, CA.
- 2019 **Yang, Anni**, Juan Pablo Gomez, Jason K. Blackburn. Exploring Environmental Coverages of Species: A New Variable Contribution Estimation Methodology for GARP based on rulesets. *Association of American Geographer (AAG) Annual Meeting*, Washington DC. serve as Chairperson for “Biogeography and Environmental Science” session.
- 2018 **Yang, Anni**, Kelly M. Proffitt, Valpa Asher, Jason K. Blackburn. Resource Selection Differences between Southwestern Montana Male elk and Female elk (*Cervus Canadensis*) during Anthrax Risk Period. *Wildlife Disease Association International Conference*. St. Augustine, FL.
- 2018 Blackburn, Jason K., Emily T. Dinh, Jeremy P. Orange, **Anni Yang**, Samantha M. Wisely. Host Ecology in Farmed vs. Wild Deer. *Wildlife Disease Association International Conference*. St. Augustine, FL.
- 2018 Sloyer, Kristin, Jason K. Blackburn, **Anni Yang**, Joseph L. Corn, Stacey L. Vigil, Bethany L. McGregor, Samantha M. Wisely, Nathan. Burkett-Cadena. Ecological Niche Modeling of Four Culicoides Species of Veterinary Significance in Florida Using Genetic Algorithm for Ruleset Prediction (GARP). *Wildlife Disease Association International Conference*. St. Augustine, FL.
- 2018 Yang, Di. **Anni Yang**, Han Qiu, Hannah Herrero, Chiung-Shiuan Fu, Qiang Yu, and Jingyin Tang. Contributions of Citizen Science to Regional Landscape Ecology: The Impact of Land-use on Flooding Due to Hurricane Harvey. *US Regional Association of the International Association for Landscape Ecology Annual Meeting*. Chicago, IL.
- 2018 **Yang, Anni**, Juan Pablo Gomez, Emily Almberg, Jenny Ramsey, Justin Gude, Catherine G. Haase, Kelly M. Proffitt, Jason K. Blackburn. Effects of Brucellosis Serological Status on Physiological Condition and Behavioral Mechanisms of

Southwestern Montana Elk. *Association of American Geographer (AAG) Annual Meeting*, New Orleans, LA.

- 2018 **Yang, Anni**, Juan Pablo Gomez, Emily Almberg, Jenny Ramsey, Justin Gude, Catherine G. Haase, Kelly M. Proffitt, Jason K. Blackburn. Effects of Brucellosis Serological Status on Physiological Condition and Behavioral Mechanisms of Southwestern Montana Elk. *Emerging Pathogens Institute's Research Day*, University of Florida, Gainesville, FL.
- 2017 Blackburn, Jason K., Andy Lyons, **Anni Yang**, Emily T. Dinh, Jeremy Orange, Kathrine. Sayler, Samantha Wisely. Time Use Mapping Versus Home Range-Specific Estimates of Host Revisitation and Duration Metrics to Examine Indirect Disease Transmission from Wildlife GPS Movements. *Association of American Geographer (AAG) Annual Meeting*, Boston, MA.
- 2017 Nekorchuk, Dawn M., Lilian R. Morris, Eric R. Dougherty, Cody Griffin, **Anni Yang**, Emily T. Dinh, Eve T. Bohnett, Kelly M. Proffitt, Sadie J. Ryan, Jason K. Blackburn. Effects of Available Area Definitions and Animal Movement Pattern Types in Resource Selection Functions. *Association of American Geographer (AAG) Annual Meeting*, Boston, MA.
- 2016 **Yang, Anni**, Joseph P. Messina. A Cost Model for Tsetse Control in Tanzania, 2016. *Association of American Geographer (AAG) Annual Meeting*, San Francisco, CA.
- 2015 Li Xiaomeng, Ran Wang, **Anni Yang**. Detecting Neighborhood Vacancy Level in Detroit City Using Remote Sensing, *American Geophysical Union (AGU) Annual Meeting*, San Francisco, CA.

TEACHING EXPERIENCE

Guest lecturer	FW469 Conservation and Management of Large Mammals	2019
Guest lecturer	GEOG4938/6938: Applications in GIS for Spatial Epidemiology and Disease Ecology (2 weeks)	2018
Instructor	Ecological Niche Modeling Workshop	2017
Material prepare	GIS Tutorial	2017

TUTORING EXPERIENCE

Lindsay Clontz (Master student visited from UGA)	Project: <i>Spatial ecology of wild pigs in South Carolina</i> <ul style="list-style-type: none"> Guidance on investigating behavioral states. Helped setting up data and analyses 	2019.12
Johanna Lange (undergraduate employee at NWRC)	Project: <i>Cost-benefit analysis on oral rabies vaccination (ORV) project for skunks</i> <ul style="list-style-type: none"> Guidance on developing project objectives and framework 	2019.10 – 2020.07

- Helped with all parts of analyses and modeling
- Guidance on report and manuscript writing

Olawale Adeyemo (Master student from EEB Mentor Match Program)	Developing NSF EEB graduate student fellowship proposal <ul style="list-style-type: none"> • Discuss research ideas and direction • Provide research insight on EEB proposal • Guidance on applying to Ph.D. Program 	2020.7 – present
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FUNDING PROPOSAL ANTICIPATED

2020	Kezia Manlove (PI), Guillaume Bastille-Rousseau, Mark Wilber, Meggan Craft, Kim Pepin, George Wittemyer, Anni Yang . From landscapes to hotspots: Leveraging new horizons in movement ecology to extend the scope of spatial host-pathogen models. <i>NSF-EEID</i>	Not funded (ranked as “competitive”)
2020	Anni Yang (PI) , Di Yang, Jue Yang. Investigating wildfire effects on ecosystem sustainability using artificial intelligence and citizen science. <i>Microsoft Azure AI for Earth</i>	\$15,000
2019	Yu Wei (PI), Anni Yang , Christina Cavaliere, Benson Delwin, Jack Capp, Joel Berger, Karina Pulkkonen, Samantha Evans, Ontita Vincent, Stacey Lynn. Improving international graduate students/scholars retention and success through interactive learning. <i>Funded by the Graduate School of Colorado State University.</i>	\$1,000
2019	Meggan Craft (PI), Guillaume Bastille-Rousseau, Kezia Manlove, Paul Cross, George Wittemyer, Mark Wilber, Lauren White, Kim Pepin, Anni Yang . Predicting spatial disease dynamics on changing landscapes from animal movement and behavior. <i>Funded by the University of Minnesota’s Institute on the Environment.</i>	\$3,000
2018-2019	Geography Department Travel Grants. <i>Funded by the Department of Geography, University of Florida</i>	\$300
2018	Graduate School Travel Grants. <i>Funded by the Graduate School of University of Florida</i>	\$300
2016	Graduate School/College/Department Travel Grants. <i>Funded by the Graduate School/Social Science College/Department of Geography of Michigan State University</i>	\$1,250
2015	Graduate Office Fellowship for Summer. <i>Funded by the Graduate School of Michigan State University</i>	\$800
2015	Graduate Office Fellowship for Spring. <i>Funded by the Graduate School of Michigan State University</i>	\$1,800

2013	Designing and Implementation of Mobile Grid Marketing System Based on GIS/GPS/RS. <i>Funded by Chinese National College Student Innovation Experiment Program</i>	\$1,900 (¥ 12,000)
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PROFESSIONAL TRAININGS

2021	National Wildlife Research Center & CSU: Wildlife Disease Workshop, Fort Collins, CO, (Online).	
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HONORS AND AWARDS

Third Prize in the Sixth Zetai Cup National Surveying and Mapping Thesis Contest	2013
First Prize of Undergraduate GIS Category, Jiangsu Province Geomatics and Geographical Information Software Design Creativity Competition	2013
Exceptional Student Scholarship (\$200)	2012
Study Progress Scholarship (\$100)	2011

INDUSTRIAL WORKING EXPERIENCE

Intern	Nanjing Luculent Software Co., Ltd. Nanjing, China	2014
Intern	Geological Surveying Institute of Chongqing, Chongqing, China	2012

SERVICE TO PROFESSION

Journals	<i>PeerJ (1), Ecological Applications (1), Animal Conservation (1), Acta Tropica (1), Sustainability (5), International Journal of Environmental Research and Public Health (4), Journal of Wildlife Management (1), Scientific Reports (1), Water (1), Journal of Environmental Management (1)</i>
Grants	UF Graduate school travel grants review panel (2018 Fall)

PROFESSIONAL ORGANIZATIONS

Association of American Geographers, The Ecological Society of America, Wildlife Disease Association, GeoVet

TECHNICAL EXPERTISE

- Programming: Python, R, JavaScript, Matlab, SQL
- GIS/Remote sensing: ArcGIS, R, QGIS, ENVI, ERDAS Imagine, Google Earth Engine
- Agent-based model: NetLogo, Python, R
- Spatial Network model: ArcGIS, R
- Ecological Niche Modeling: GARP, MaxEnt, Boosted Regression Trees, Random Forest
- Statistics: Bayesian Statistics, Spatial Statistics, Machine/Statistical Learning

SERVICE

2019 – present Warner College International Affairs Committee members (post-doc/staff representative)
2018 – present Volunteer for GISCorps
2016 – 2019 Member of Graduate Assistant Union
