

Reilly Nash Brennan
Blacksburg, VA 24060
(908) 812-5104 | reillybrennan@vt.edu

Education

- 2022-present* **Virginia Polytechnic Institute and State University**
College of Agriculture and Life Sciences, Blacksburg, VA
PhD Student, Entomology, GPA: 4.0
Advisors: Dr. Luis Escobar, Dr. Sally Paulson
- 2018-2022* **Rutgers University Honors College**
School of Environmental and Biological Sciences, New Brunswick, NJ
Bachelor of Science, Ecology, Evolution, and Natural Resources, GPA: 3.9
Advisors: Dr. Dina Fonseca, Dr. Henry John-Alder

Awards

- 2024* Virginia Tech Gladys and Clarence Hill Award for Graduate Students
- 2022-present* Virginia Tech ICTAS Doctoral Fellow (stipend and tuition)
- 2022* Rutgers University Entomology Student Research Colloquium 1st Place
- 2022* Rutgers University E.B. Moore Forestry Award for Outstanding Student,
- 2022* NSF Graduate Research Fellowship Program, Honorable Mention
- 2021* Rutgers University Bruce A. Hovland Memorial Scholarship in Forestry
- 2021* Rutgers University Ralph E. Good Award, Pinelands Field Station
- 2020* New Jersey Mosquito Control Association Educational Scholarship
- 2020* Rutgers University Tillie Hoitsma Scholarship
- 2020* Rutgers University Karen Hoffman Smoyak Student Prize
- 2019* Rutgers University Betty Glazer Young Scholarship
- 2018-2022* Rutgers Trustee Scholars Tuition Scholarship

Research Positions

- 2021-2022* George H. Cook Research Scholar
Advisors: Dr. Dina Fonseca and Dr. Henry John-Alder
- Compare the abundance and diversity of tick species in the New Jersey Pine Barrens in forests with different compositions and management techniques.
 - Gather forest inventory information using tree species, height, site age and land use history. Sample for ticks using flagging techniques. Characterize microclimate of different forest sites using multiple data loggers.
 - Train and manage a team of students in practical field techniques.
 - Organize and perform molecular analysis for pathogens on over 700 samples.
- 2020-2022* Research Assistant, Rutgers University Center for Vector Biology
Advisors: Dr. Dina Fonseca
- Evaluate the presence of salt marsh mosquitoes in New Jersey using filtered water samples and eDNA detection with targeted real time PCR assays.
 - Assist in the analysis of 12 microsatellite markers from invasive mosquito species.

- Develop molecular methods for analysis of mammalian tick bloodmeals.
- Assess the accuracy of a novel real time PCR assay for use in eDNA detection of an invasive tick species (*Haemaphysalis longicornis*) in soil, arthropod midguts (looking for natural arthropod predators of ticks), and air samples.

2019-2020 Research Assistant, Rutgers University Center for Vector Biology

Advisors: Dr. Dana Price

- Collect mosquito specimens using the CDC standard light and box gravid traps. Allow the mosquitoes to feed on sugar-soaked nucleic acid preservation cards (Flinders Technology Associates; FTA) to capture DNA and viral RNA for extraction and elution.
- Extract viral RNA from mosquitoes and from FTA cards and utilize RT-PCR and cDNA synthesis for identification of West Nile Virus presence.
- Prepare samples for Illumina libraries to be analyzed with the use of bioinformatic tools.

2019 Aresty Summer Science Student, Rutgers University Center for Vector Biology

Advisors: Dr. Dana Price

- Performed microbiome analysis of the invasive *Haemaphysalis longicornis* and *Ixodes scapularis* ticks from field collected samples in New Jersey.
- Collected tick specimens using tick flagging techniques and extracted DNA from both whole ticks and midgut dissections.
- Utilized next-generation shotgun metagenome sequencing to classify millions of genomic DNA sequences in the tick microbiome, first to domain and then to the genus level for identification of potential pathogens or endosymbionts.

Publications

1. Brennan, R. N., Paulson, S., Escobar, L.E., Estimating pathogen spillover risk using host-ectoparasite interactions. *Ecology and Evolution*. 2024, 14, e11509. <https://doi.org/10.1002/ece3.11509>
2. Brennan, R.N., Boychuck, S., Washkwich, A.J., John-Alder, H., Fonseca, D. R Tick abundance and diversity are substantially lower in thinned vs. unthinned forests in the New Jersey Pinelands National Reserve, USA. *Ticks and Tick-borne Diseases*. 2023 Mar;14(2):102106. doi: 10.1016/j.ttbdis.2022.102106
3. Sullivan, C.F., Fonseca, D.M., Occi, J.L., Brennan, R.N., Robbins, R.G., Bennett, A.B., Parker, B.L., Skinner, M. First report of the bat tick *Carios kelleyi* (Ixodida: Argasidae) from Vermont, USA. *Journal of Medical Entomology*. 2022 Mar 16: 59(2):784-787. doi: 10.1093/jme/tjab232
4. Price, D.C., Brennan, R.N., Wagner, N.E., Egizi, A. Hologenome comparison of two *Ixodes scapularis* populations in Monmouth County, New Jersey. *PeerJ*. 2021 Nov 9;9:e12313 doi: 10.7717/peerj.12313

Presentations

1. Brennan, R.N., Paulson, S., Escobar, L.E., IV Congreso Latinoamericano de Mastozoología, Santiago, Chile, October 2024. “Ecological and phylogenetic factors of hantavirus transmission in Chile”. *oral presentation, Spanish*
2. Brennan R.N., Paulson S., Escobar L. E., Global Change Center Graduate Symposium , Virginia Polytechnic Institute and State University, Blacksburg, Virginia, April 2024. “Estimating pathogen spillover risk using host-ectoparasite interactions” *poster*
3. Brennan R.N., Paulson S., Escobar L. E., Center for Emerging Zoonotic and Arthropod-borne Pathogens Research Symposium, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, October 2023. “Estimating pathogen spillover risk using host-ectoparasite interactions” *poster*
4. Brennan R.N., Paulson S., Escobar L. E., Institute for Critical Technology and Applied Science, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, March 2023. “Connection through parasites: Host-parasite relationships in a rodent-ectoparasite system in Chile” *poster*
5. Brennan R.N., & Gallagher M., 33rd Annual Pinelands Short Course, Stockton University, NJ March 2022. Hosted by the New Jersey Pinelands Commission. “Forest-tick Interactions in the New Jersey Pinelands” *course*
6. Brennan R.N., New Jersey Mosquito Control Association Annual Banquet, Atlantic City, NJ, March 2022. “Impacts of Forest Thinning on Ticks and Tick-borne pathogens in the New Jersey Pinelands” *oral presentation*
7. Brennan R.N., Northeast Regional Center for Excellence in Vector-Borne Diseases Annual Meeting, Online, March 2022. “What is Eating the Asian Longhorned Tick?” *oral presentation*
8. Brennan R.N., & Savage A., PSEG Institute for Sustainability Studies, Green Teams Internship Program Guest Speaker, July 2021. “Nature at the Interface with Human Activity” *interactive presentation*
9. Brennan R.N., Aresty Summer Science Research Symposium, New Brunswick, NJ, August 2019. “Comparison of the Tick Microbiome using Metagenomic Analysis” *poster*

Outreach and Professional Positions

2022-present Regional Organizer and Co-founder, New River Valley Queer Climbing, Regional Organization
Host monthly meetups, organize events, and volunteer in the region to improve access of the LGBTQIA+ group to the outdoors

2018-2019 Big Brothers and Big Sisters Volunteer, NJ

Served as a mentor for a child in the BBBS program by increasing their involvement in the local community, helping them break out of their comfort zone, and forming a relationship based on communication and trust.

2018-2019 Community Health Interpreter, Eric B. Chandler Clinic, NJ
Provided language assistance to Spanish speaking patients. Transitioned between multiple care units and situations

2014-2017 Student Representative, Highland Park Board of Health, NJ
Collaborated with the Middlesex County Mosquito Extermination Commission to develop a town-wide mosquito awareness plan.

Technical Skills

Laboratory: BSL2 containment, ABLS3 containment, small animal handling and restraint, core IACUC training (AALS), Molecular biology skills: DNA and RNA extraction and quantitation methods, PCR / RT-PCR / qPCR optimization, NextGen Library preparation, tick dissection

Field: small mammal trapping, small mammal handling and sample techniques (anesthesia, necropsy, retro-orbital and saphenous vein blood collection, measurements, oral, anal and urine swab, ear punch), environmental tick surveillance by standardized flagging and dragging, tree inventory techniques (Diameter at breast height 'DBH', bearing, height, distance, basal area), tree identification, mosquito trapping, tick identification, reptile handling and inspection

Computational: R programming language for statistical methods, bioinformatic techniques for analysis of sequencing data including but not limited to: Unix OS, MegaX, Trimmomatic, DIAMOND

Languages: English, Spanish