Curriculum Vitae

## Education

### Doctor of Philosophy

2018 – 2024 Tulane University, Department of Ecology and Biology

### Master of Science

University of Michigan – Ann Arbor - Major: Conservation Ecology

### Bachelor of Arts

University of Puerto Rico – Rio Piedras

* Major: Political Science (Magna Cum Laude)

## Skills

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| **Leadership** | Effective communication, Decision-Making, Critical thinking, Team collaboration, Problem-solving, Adaptability |
| **Interpersonal Skills** | Mentoring, Cross-functional collaboration, Team-building, Conflict resolution, Stakeholder communication |
| **Programming/Interface** | R, Python, Bash, Rust, SQL, LaTex, Markdown |
| **Data/Web Reporting** | Quarto, Shiny |
| **OS/Shell Experience** | Linux, PowerShell, WSL |
| **Cloud Computing** | CentOS 7 HPC |
| **Data Wrangling and Visualization** | *tidyverse*, *ggplot2*, Tableau |
| **Version Control** | Git and GitHub |
| **Bioinformatic Tools** | GATK, samtools, cutadapt, Trimmomatic, *phyloseq* and *microeco* |

## Peer-Reviewed Publications and Pre-Prints

* Dong, C. M., **Aponte Rolón, B.**, Sullivan, J. K., Tataru, D., Deleon, M., Dennis, R., Dutton, S., Machado Perez, F. J., Montano, L., & Ferris, K. G. (2024, June 29). Short-term fluctuating and long-term divergent selection on sympatric Monkeyflowers: Insights from decade-spanning reciprocal transplants. <https://doi.org/10.1101/2024.06.26.600870>
* **Aponte Rolón, B.**, Arnold, A. E., Sánchez Juliá, M., & Van Bael, S. A. (2024, April 19). *Evaluating the Role of Endophyte-Rich Leaves in Protecting Tropical Trees Against a Generalist Herbivore and a Pathogen.* <https://doi.org/10.1101/2024.04.18.589827>
* **Aponte Rolón, Bolívar**, & Perfecto, I. (2023). Between two trees: Environmental effects of *I. micheliana* and *A. latifolia* on leaf litter ants in a coffee agroecosystem. *Ecosphere, 14(2)*, e4442. <https://doi.org/10.1002/ecs2.4442>
* Dáttilo, W., Vásquez‐Bolaños, M., Ahuatzin, D. A., Antoniazzi, R., Chávez‐González, E., Corro, E., Luna, P., Guevara, R., Villalobos, F., Madrigal‐Chavero, R., De Faria Falcão, J. C., Bonilla‐Ramírez, A., Romero, A. R. G., De La Mora, A., Ramírez‐Hernández, A., Escalante‐Jiménez, A. L., Martínez‐Falcón, A. P., Villarreal, A. I., Sandoval, A. G. C., … MacGregor‐Fors, I. (2020). Mexico’s Ants: Who are They and Where do They Live? *The Bulletin of the Ecological Society of America, 101(2)*, Mimuluse01666. <https://doi.org/10.1002/bes2.1666>
* Dáttilo, W., Vásquez‐Bolaños, M., Ahuatzin, D. A., Antoniazzi, R., Chávez‐González, E., Corro, E., Luna, P., Guevara, R., Villalobos, F., Madrigal‐Chavero, R., Falcão, J. C. D. F., Bonilla‐Ramírez, A., Romero, A. R. G., De La Mora, A., Ramírez‐Hernández, A., Escalante‐Jiménez, A. L., Martínez‐Falcón, A. P., Villarreal, A. I., Sandoval, A. G. C., … MacGregor‐Fors, I. (2020). Mexico ants: Incidence and abundance along the Nearctic–Neotropical interface. *Ecology, 101(4)*, e02944. <https://doi.org/10.1002/ecy.2944>
* Schmitt, L., **Aponte-Rolón, B.**, & Perfecto, I. (2020). Evaluating community effects of a Keystone Ant, *Azteca sericeasur*, on *Inga micheliana* leaf litter decomposition in a shaded coffee agro-ecosystem. *Biotropica, 52(6)*, 1253–1261. <https://doi.org/10.1111/btp.12833>

## Software & Data

* **Aponte Rolón, B.**, Blake, R. E., Berys, C., Gum, J., & Wood‑Charlson, E. M. (2025). esipDMP: Data Management for Success. https://doi.org/10.5281/ZENODO.17252143
* **Aponte Rolón, B.**, Kristy, B., & Benucci, G. (2025). BRCore: Provides a set of tools to process and analyze microbial data from Bioenergy Research Centers. Retrieved from https://github.com/germs-lab/BRCore. R package version 0.1.0, commit b3915756f8eef04947597359a2c365349c372a00.
* Rieke, M., & **Aponte Rolón, B.** (2025). Nplyr: A grammar of nested data manipulation. Retrieved from https://jibarozzo.github.io/nplyr/. R package version 0.3.0.

## Other Publications

* **Aponte Rolón, B.** (2023). High-Molecular-Weight SPRI-aided DNA extraction fro Mimulus MimulusMimulus \* Mimulus Mimulus MimulusMimulusMimulus\* (Phrymaceae) leaf tissue. <dx.doi.org/10.17504/protocols.io.bp2l6xn8rlqe/v2>
* Pérez-Figueroa, O., & **Aponte Rolón, B.** (2020). Clashing Resilience: Competing Agendas for Recovery after the Puerto Rican Hurricanes • SftP Magazine. *Science for the People Magazine*, 23(1). <https://magazine.scienceforthepeople.org/vol23-1/clashing-resilience-competing-agendas-for-recovery-after-the-puerto-rican-hurricanes/>

## Professional Experience

Post-Doctoral Research Associate Jan-2025-Present

**Department of Agricultural and Biosystems Engineering, Iowa State University, Ames, IA**

* **Developed high-throughput, reproducible pipelines** for large-scale microbiome analysis, enabling robust identification of core and non-core microbial communities across multiple Bioenergy Research Centers (BRCs) using R, parallel computing, and high-performance cluster resources.
* **Author and maintainer of the “BRCore” R package**. Implemented novel methods for core microbiome extraction based on Bray-Curtis dissimilarity and abundance-occupancy modeling, now used as a foundational tool within the Inter-BRC Microbiome project.
* **Enabled cross-center, cross-crop comparative analyses** by standardizing data processing, quality control, and statistical workflows (e.g., ordinations, dbRDA), directly supporting multi-institutional collaboration and increasing analytical consistency.
* **Produced publication-ready visualizations and summary statistics** that revealed robust patterns of core microbial taxa and their ecological drivers, informing both experimental design and biological interpretation within the BRC network.
* **Demonstrated the ecological significance of core taxa**, quantifying their contribution to community dissimilarity and highlighting deterministic versus stochastic assembly processes in plant-microbe interactions.
* **Empowered team members and collaborators** by providing well-documented, reusable code, comprehensive reports, and training, thereby enhancing the overall reproducibility, transparency, and impact of the research program.
* **Accelerated research outputs and scientific communication**, delivering actionable insights and high-quality figures/tables for manuscripts, presentations, and stakeholder reports in the field of microbial ecology and bioinformatics.

Technical Lead & Platform Architect Jan-2025-Present

**Earth Science Information Partners - Data Stewardship Committee, Severna Park, MD**

* **Technical Lead & Platform Architect for ESIP’s “esipDMP: Data Management for Success”**, defined the Quarto-based site architecture and information model, organizing content into clear domains with sidebar search, global TOC, and page navigation for discoverability.
* **Built a clear, efficient front-end on Bootswatch**: customized CSS/SCSS and HTML components to establish consistent layout, typography, and reusable patterns that scale for an open-source community of data practitioners.
* **Operationalized, contributor-friendly workflows and deployment**: architected a GitHub Pages publishing pipeline with deterministic URLs, standardized outputs, and repo-actions/issue templates to streamline PRs and community feedback.
* **Led cross-community collaboration (ESIP Data Stewardship Committee)**, establishing review pathways and content stewardship practices while maintaining a continuously deployed high-signal community-owned public resource.
* **Standardized navigation and content templates to reduce contributor friction and maintenance overhead**, enabling incremental, peer-reviewed additions while preserving a stable, version-controlled site foundation.

Data Scientist 2018-2024

**Department of Ecology and Evolutionary Biology, Tulane University, New Orleans, LA**

* **Owned experimental design, data collection, analysis and interpretation for 3 research projects** focused on understanding the interactions of fungal symbionts, and host-associated genes, resulting in production of 2 peer-reviewed articles.
* **Developed R, Python, and Bash modules to process genomic and metagenomic data** by applying the DADA2 and USEARCH algorithms for novel fungal discovery.
* **Applied GLMMs, ANOVAs, and clustering algorithms (PCA, LDA) in R** to analyze biological datasets or 3 research projects.
* Executed processing workflows via SLURM on a HPC cluster environment.
* **Collaborated with a team of 6+ members** to develop workflows for troubleshooting genomic data processing pipelines with GATK tools; the resulting workflow is hosted on GitHub.
* **Enhanced R package function features to handle additional diversity measures**; forked and submitted pull request to the open-source “mirlyn” package.
* **Ensured data integrity and reproducibility of statistical analyses**; curated and prepared data for submission to public relational databases.
* **Cleaned, validated and submitted genomic data to public relational databases** NCBI and GenBank.
* **Managed genomic relational databases (100K+ rows and 10+ tables)** and documented data processing and dependencies on GitHub to ensure reproducibility of statistical analyses.
* **Developed and maintained training vignettes to increase team’s data analytics and bioinformatic core competencies** in R and Bash to operate in HPC cluster environment and Unix‐like systems.
* **Communicated research outcomes to stakeholders and the scientific community** by presenting at 4 national and 2 international conferences.

Product Developer Jan. – May 2024

**Connolly Alexander Institute for Data Science, Tulane University, New Orleans, LA**

* **Developed and presented a proposal to enhance accessibility to data science tools like Tableau, R, and Python** for university students of all skill levels, utilizing public repositories to host shared resources and curricular materials.
* **Created and managed a GitHub Pages website for CAIDS, supporting curricular applications and offering accessible resources on data science**, including tutorials on version control and introductory R.
* **Led a team of 10 data research interns to develop data literacy workshops** for the broader student body, which grew social media engagement by 150%.
* **Facilitated and led team dynamics with agile strategies** to increase efficiency for the development of workshops and social media strategies.
* **Ensured transfer of knowledge and increased team core competencies** through internal workshops (e.g., introduction to Excel, Intro to Project Management).
* **Assessed the Data Ambassador Council’s impact on fostering a data-driven community** on campus and identified the need for enhanced team-building activities and a structured onboarding process to improve program effectiveness.

Coordinator Jan. 2023 – Jan. 2024

**Tulanians Who Enjoy R Coding (TWERC), Tulane University, New Orleans, LA**

* **Coordinated the R user group** at Tulane University with a membership of approximately 15 - 20 individuals.
* **Facilitated the development of 4-5 R programming language workshops per semester** where students and peers applied coding skills to enhance research methods and tools for academic and professional advancement.
* **Played a pivotal role in informing the state of data science literacy** of members to faculty and staff in order to expand official data science programs and course offerings.

Data Science Instructor Sept. – Dec. 2023

**Howard-Tilton Memorial Library, Tulane University, New Orleans, LA**

* **Developed and delivered virtual workshops and training material** about version control, data visualization, and R to an audience of 70+ people.
  + Introduction to R - 30+ participants.
  + Introduction to Data Visualization in R - 20+ participants.
  + Introduction to Version Control with Git and GitHub - 20+ participants.

Ecological Data Scientist Aug. 2015 – May 2018

**School for the Environment and Sustainability, University of Michigan, Ann Arbor, MI**

* **Led a team on a 4-month biological sample collection in Mexico**; designed experiments, coordinated sample QC, data collection, and exploratory data analyses in R.
* **Applied GLMMs, ANOVAs, and PERMANOVA analyses** to understand interactions of ants and leaf litter nutrients in the tropics; visualized results with “ggplot2” in R.
* **Results were published in two articles in high-impact, peer-reviewed journals** and presented at international conferences.

## Teaching Experience

#### Tulane University 2018-2024

##### Instructor *Howard-Tilton Memorial Library, Tulane University, New Orleans, LA.*

* October 2023 | *Introduction to Version Control with Git and GitHub*. Developed by **B. Aponte Rolón**
* October 2023 | *Introduction to Data Visualization in R*. Developed by **B. Aponte Rolón** .
* October 2023 | *Introduction to R, Part 1*. Developed by Mike Ellis and led by **B. Aponte Rolón**

##### Teaching Assistant *Department of Ecology and Evolutionary Biology*

* Spring 2024 & Fall 2018 | **Diversity of Life - EBIO 1010**. Dr. Jelagat Cheruiyot
* Fall 2020 - 2023 & Spring 2019 | **Entomology – EBIO 4430/4431**. Dr. Jelagat Cheruiyot
* Summer 2023 | **Tropical Field Biology - EBIO 3780**. Dr. Sunshine Van Bael
* Spring 2023 | **Natural History of Louisiana - EBIO 2330**. Dr. Donata Henry
* Spring 2023 | **Theory and Methods in Ecology and Evolutionary Biology - EBIO 2020**. Dr. Donata Henry
* Spring 2022 | **Insects and Human Interactions – EBIO 2210**. Dr. Jelagat Cheruiyot
* Spring 2021 - Fall 2019 | **Plants and Human Affairs – EBIO 3180/3185**. Dr. Keith Clay
* Spring 2020 | **Plant Biology and Adaptation - EBIO 3590/3591**. Dr. Jelagat Cheruiyot

#### University of Michigan 2016 - 2017

* Fall 2017 | **NRE 509: Ecology: Concepts and Applications**. Dr. Sheila K. Schueller
* Fall 2016 | **ENVIRON 270: Our Common Future**. Dr. Ivette Perfecto

#### Guest Lectures 2024

* Fall 2024 | **BIO 395** **Introduction to R Programming for Biologists**, Grinnell College

## Conference Presentations and Posters

**Aponte Rolón, B.** (2025 June). *Poster*. “From Granite to Meadow: How Host Genetics and Habitat Shape Foliar Endophyte Communities in Monkeyflowers”. Evolution 2025, Athens GA, USA.

**Aponte Rolón, B.** (2023 June). *Oral Presentation*: “Foliar fungal symbionts in sympatric yellow monkeyflowers along an elevational gradient”. Evolution 2023, Albuquerque, NM, USA.

**Aponte Rolón, B.** (2023 March). *Poster*: “The Influence of host genotype and leaf trait plasticity on foliar fungal endophytes of yellow monkeyflowers in Yosemite National Park, CA”. Collaborators: Kathleen Ferris & Sunshine Van Bael. Tulane Research, Innovation, and Creativity Summit (TRICS), Jung Hotel Grand Hall, New Orleans, LA, USA.

**Aponte Rolón, B.** (2022 July). *Oral Presentation*: “Interactions between functional leaf traits and foliar endophytes in the defense against natural enemies of tropical trees” (ID: 358). The 58th Meeting of the Association for Tropical Biology and Conservation (ATBC 2022), Cartagena de Indias, Colombia.

**Aponte Rolón, B.** (2022 May). *Poster*: “The Influence of host genotype and leaf trait plasticity on foliar fungal endophytes of yellow monkeyflowers in Yosemite National Park, CA”. Collaborators: Kathleen Ferris & Sunshine Van Bael. Yosemite Symbiosis Workshop. Wawona, CA, USA.

**Aponte Rolón, B.** (2020 July). *Graphical Abstract*: “Investigating trade-offs and complementarity between functional leaf traits and foliar endophytic fungi in the defense against plant enemies of tropical woody plants”. Collaborators: A. Elizabeth Arnold, and Sunshine Van Bael. The Mycological Society of America’s First Virtual Meeting, MSA 2020: Mycology from the Cloud (virtual).

**Aponte Rolón, B.** (2019 May). *Poster*: “Leaf and Root Endophytes of Mangroves in Southwestern Florida Everglades”. Collaborators: Mareli Sánchez Juliá, Edward Castañeda, John Kominoski, & Sunshine Van Bael. Florida Coastal Everglades LTER All Scientists Meeting. Fairchild Tropical Botanic Garden, Miami, Florida.

**Aponte Rolón, B.** (2017 October). *Poster*: “Quality of leaf-litter and ant assemblages in shade-grown coffee in Chiapas, Mexico”, Collaborator: Ivette Perfecto. Student Conference on Conservation Science-New York (SCCS-NY), American Museum of Natural History in New York City, NY, USA.

**Aponte Rolón, B.** (2017 July). *Poster*: “Impacts of quality of leaf-litter on ant assemblages in shade-grown coffee in Chiapas, Mexico”, Collaborator: Ivette Perfecto. 54th Annual Meeting of the Association for Tropical Biology and Conservation, “Ecological and Social Dimensions of Tropical Biodiversity Conservation”, Merida, Yucatan, Mexico.

**Aponte Rolón, B.** (2014 May). *Poster*: “El efecto del Curcumin en la señalización celular de Artritis Psoriática” [The Effect of Curcumin on cell signaling of Psoriatic Arthritis]. (With Carrero Feliciano, Heysel M.; Hall Laureano, Stephanie; Montes González, Ingrid, PhD.) Annual poster presentation of the American Chemical Society, Puerto Rico Chapter, University of Puerto Rico, Río Piedras Campus, San Juan, Puerto Rico.

## Seminars & Workshops

**Delegate** (Aug. Sept. 2014): *“Encuentro latinoamericano y caribeño: asamblea intermedia”*. [Intermediate Assembly of the *Consejo de Educación Popular de América Latina y el Caribe-CEAAL*]. Quito, Ecuador.

**Delegate** (October 2013): *“Rumbo a la asamblea intermedia”*. Sponsored by the *Consejo de Educación Popular de América Latina y el Caribe-CEAAL*. Santo Domingo, Dominican Republic.

**Organizer** (August 2013): *“Primer Encuentro Nacional de Educadores(as) Populares de Puerto Rico”*. Sponsored by *Consejo de Educación Popular de América Latina y el Caribe-CEAAL*, Pontifical Catholic University of Puerto Rico, Ponce, Puerto Rico.

**Workshop Developer** (August 2013): *“Educación Popular y Liberación Nacional”* [Workshop on Popular Education and National Liberation] Sponsored by *La Nueva Escuela* at *Primer Encuentro Nacional de Educadores(as) Populares de Puerto Rico*. Pontifical Catholic University of Puerto Rico, Ponce, Puerto Rico.

**Facilitator & organizer** (March 2012): *“Sexto Campamento de Jóvenes: Educando para una nueva Patria”* [Summit on Popular Education Critical Ideologies, Racism & Xenophobia]. La Nueva Escuela, Peñuelas, Puerto Rico.

**Organizer** (March 2012): *“Debates y perspectivas en la construcción de una reforma universitaria inclusiva”*. Sponsored by Honors Program Student Association (AEPREH), University of Puerto Rico, Río Piedras Campus. Social Sciences Faculty, University of Puerto Rico, Río Piedras Campus, San Juan Puerto Rico.

**Round table** (July 2012): “Puerto Rico: a brief historical account”. Second International Summit *“Entre las Crisis y Otros Mundos Posibles”* of the Transnational Network of Other Knowledges. Sponsored by *Centro de Investigaciones y Estudios Superiores en Antropología Social* (CIESAS), CIDECI Las Casas/ UNITIERRA-Chiapas, San Cristóbal de las Casas, Chiapas, México.

**Workshop Developer** (September 2010): *“Taller de Educación Popular”* [Workshop on Popular Education]. *La Nueva Escuela* at The University of Puerto Rico, Río Piedras Campus, San Juan, Puerto Rico.

**Workshop Developer** (May 2010): *“Taller de Educación Popular y el Movimiento Estudiantil”* [Workshop on Popular Education and the Student Movement]. *La Nueva Escuela* at The University of Puerto Rico, Río Piedras Campus, San Juan, Puerto Rico.

## Grants and Fellowships

* **Department of Ecology and Evolutionary Biology**  
  2020, 2021, 2022 *Tulane University, New Orleans, LA*  
  Student Research Grant
* **Office of Graduate and Post-Doctoral Studies**  
  2021-2022 *Tulane University, New Orleans, LA*  
  OGPS Fellowship
* **Rackham Graduate School**  
  2017 *University of Michigan, Ann Arbor, MI*  
  Rackham International Research Award
* **Rackham Graduate School**  
  2017 *University of Michigan, Ann Arbor, MI*  
  Rackham Conference Travel Grant
* **Rackham Graduate School**  
  2015 *University of Michigan, Ann Arbor, MI*  
  Rackham Master Fellowship

## Awards & Honors

* **Exceptional Teaching of an Upper Level Course** May 2024
* *Steven P. Darwin Outstanding Teaching Assistant Award*  
  *Tulane University, New Orleans, LA*
* **Summer Graduate Award** July 2023
* *The Connolly Alexander Institute for Data Science*  
  *Tulane University, New Orleans, LA*
* **Travel Award** May 2022 & 2023
* *Graduate Studies Student Association*  
  *Tulane University, New Orleans, LA*
* **Dean’s Travel Award** May 2022 & 2023
* *School of Science and Engineering*  
  *Tulane University, New Orleans, LA*
* **Jeffrey Lund Forest Ecology Award** April 2017
* *School for the Environment and Sustainability*  
  *University of Michigan, Ann Arbor, MI*
  + Annual award for academic excellence, research capability, and professional promise.

## Communities and Organizations

 [Posit Data Science Hangout](https://posit.co/data-science-hangout/)

 [R4DS Learning Community](https://rfordatasci.com/)