Renata M. Diaz, Ph.D.

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EDUCATION

Ph.D., Interdisciplinary Ecology – University of Florida – 2022

- Advisor: S. K. Morgan Ernest

B.A., Ecology and Evolutionary Biology, *high honors* – Princeton University – 2015

- Advisor: Robert M. Pringle

QUALIFICATIONS

- Seven years' experience developing open-source software and scalable data pipelines for biology (maintainer of 2 and contributor to 5+ R packages)
- Track record of successful application of novel analytical methods to understand ecological change (publications in *Ecology Letters*, *Ecology*, *Global Ecology and Biogeography, Journal of Open Source Software*).

TECHNICAL SKILLS

- Programming, data analysis, and visualization in R, Shiny, python, bash
- Designing and deploying code for high-performance and cluster computing (make-like workflows, slurm scheduling, data management and transfer)
- Software development, containerization, and automation (usethis, unit testing, GitHub Actions, Travis CI, Docker)
- Collaborative open-source software development (git, GitHub, Agile workflows)
- Machine learning, frequentist, and Bayesian statistics applied to ecological data

EXPERIENCE

Data Scientist III – Communications and CyberTech – University of Arizona – 2023-present

- Design and implement backend infrastructure for a global database of plant water potential data.
- Design and build an R package for accessing and wrangling timeseries of forest inventory data.
- Train researchers in reproducible computational practices via workshop series and 1:1 consults.
- Collaborate with research teams to write grants for computationally-intensive life sciences research.

NSF Postdoctoral Fellow – EcoEvoMatics Lab – University of Maine – 2022-2023

- Provided code review and oversee implementation of best-practices for graduate student developers working on Shiny apps and R/RCpp packages for the RoLE Model Project.
- Strategized pathways to stable, containerized releases of the roleR and roleShiny packages with a multi-institution, multi-disciplinary team.
- Developed classroom and workshop materials for computationally-intensive biodiversity studies (Multidimensional Biodiversity Data, offered June 2023; and Ecological and Evolutionary Theory For A Changing World, offered in Fall 2022 at the University of Maine).
- Conducted research using process models to study how complex eco-evolutionary systems respond to perturbations.

NSF GRFP Fellow/Graduate Assistant – Weecology Lab – University of Florida – 2017-2022

- Wrote and continue to maintain 2 R packages implementing number theory for theoretical ecology, and simulations of changes in avian biomass over time.
- Contributed to numerous R packages, including semi-automated access to dynamic ecological data, standardized processing of ecological timeseries and applications of natural language processing to ecological timeseries.
- Co-developed, maintained, and trained new users in a partially automated data archival system for ecological field data on rodents, plants, and weather.
- Devised and lead research projects using massive compilations of ecological data, novel statistical methodologies, and high-performance computing to understand how biodiversity changes over time.

SOFTWARE AND DATA PRODUCTS

(selected; see https://diazrenata.github.io/home/software.html)

- `birdsize` (author, maintainer): Simulate avian body size distributions. Part of the ROpenSci software ecosystem. https://docs.ropensci.org/birdsize
- `feasiblesads` (author, maintainer): Implementation of a novel counting algorithm for species abundance distributions. Stable and archived on Zenodo. https://doi.org/10.5281/zenodo.4710750
- `LDATS` (author): Natural language processing and Bayesian timeseries analysis of ecological communities. Released on CRAN. https://weecology.github.io/LDATS
- `portalr` (author): Download and summarize data associated with The Portal Project. Released on CRAN. https://weecology.github.io/portalr
- S. K. M. Ernest, et al. (2018). The Portal Project: a long-term study of a Chihuahuan desert ecosystem. bioRxiv 332783, https://doi.org/10.1101/332783

PUBLICATIONS

- R. M. Diaz and S. K. M. Ernest. Temporal changes in the individual size distribution modulate the long-term trends of biomass and energy use of North American breeding bird communities. In press, Global Ecology and Biogeography. https://doi.org/10.1111/geb.13777
- R. M. Diaz and S. K. M. Ernest. Maintenance of community function through compensation breaks down over time in a desert rodent community. Ecology 103(7): e3709. https://doi.org/10.1002/ecy.3709.
- R. M. Diaz, H. Ye, S. K. M. Ernest (2021). Empirical abundance distributions are more uneven than expected given their statistical baseline. Ecology Letters, 2021;00:1-15. https://doi.org/10.1111/ele.13820
- E. M. Christensen, G. M. Yenni, H. Ye, J. L. Simonis, E. K. Bledsoe, R. M. Diaz, S. D. Taylor, E. P. White, S. K. M. Ernest (2019). portalr: an R package for summarizing and using the Portal Project Data. Journal of Open Source Software, 4(33), 1098, https://doi.org/10.21105/joss.01098
- G. M. Yenni, E. M. Christensen, E. K. Bledsoe, S. R. Supp, R. M. Diaz, E. P. White, S. K. M. Ernest (2019). Developing a modern data workflow for regularly updated data. PLoS Biol 17(1): e3000125. https://doi.org/10.1371/journal.pbio.3000125

SERVICE, TRAININGS, AND WORKSHOPS

- Editor, Ecology and Earth Sciences track, Journal of Open Source Software, 2023-present
- Data Carpentry Instructor and Curriculum Developer, via The Carpentries, 2021, 2023
- Ally Skills Facilitator and Facilitator Trainer via FrameShift Consulting, 2019
- Data-Driven Ecological Synthesis course participant, via The Poisot Lab, 2019